FM 90-13-1 s/s by FM 3-34.2, dtd
28 Feb 91 31 August 2000

COPY 2

FM 90-13-1
Combined Arms Breaching Operations

HEADQUARTERS, DEPARTMENT OF THE ARMY

Pentagon Library (ANR-PL)
ATTN: Military Documents Section
Room 1A518, Pentagon
Washington, DC 20310-6050

DISTRIBUTION RESTRICTION. *Approved for public release; distribution is unlimited.*

COPY 2

CHANGE
No. 1

HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington, DC, 7 May 1993

COMBINED ARMS BREACHING OPERATIONS

1. Change FM 90-13-1, 28 February 1991, as follows:

Remove old pages	Insert new pages
iii and iv	iii and iv
	Appendices pages D-1 through D-15 and E-1 through E-16
Glossary-1 through Glossary-10	Glossary-1 through Glossary-12
Reference-1	Reference-1 and Reference-2
Index-1 through Index-4	Index-1 through Index-4

2. A star (★) marks new or changed material.

3. File this transmittal sheet in front of the publication.

DISTRIBUTION RESTRICTION. Approved for public release; distribution is unlimited.

By Order of the Secretary of the Army:

GORDON R. SULLIVAN
General, United States Army
Chief of Staff

Official:

Milton H. Hamilton

MILTON H. HAMILTON
Administrative Assistant to the Secretary of the Army
03852

Pentagon Library (ANR-PL)
ATTN: Military Documents Section
Room 1A518, Pentagon
Washington, DC 20310-6050

DISTRIBUTION:

Active Army, USAR, and ARNG: To be distributed in accordance with DA Form 12-11-E, requirements for FM 90-13-1, Combined Arms Breaching Operations (Qty rqr block no. 5012).

Field Manual 90-13-1

HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington, DC, 28 February 1991

Combined Arms Breaching Operations

Contents

PREFACE iv

CHAPTER 1. CHALLENGE TO MANEUVER 1-1

CHAPTER 2. OBSTACLE BREACHING THEORY 2-1
Breaching Tenets 2-1
Intelligence 2-1
Breaching Fundamentals 2-2
Suppress 2-2
Obscure 2-3
Secure 2-3
Reduce 2-3
Breaching Organization 2-3
Support Force 2-3
Breach Force 2-3
Assault Force 2-4
Mass 2-4
Synchronization 2-5
Maneuver 2-8
Types of Breaching Operations 2-8
Movement 2-10
Situation Clear 2-10
Situation Unclear 2-10
Continued Movement 2-10
Planning Sequence 2-10

CHAPTER 3. IN-STRIDE BREACH 3-1
In-Stride Breaching Fundamentals 3-1
Suppress 3-1
Obscure 3-2
Secure 3-2

DISTRIBUTION RESTRICTION. Approved for public release; distribution is unlimited.

Reduce 3-2
Task Force In-Stride Breach 3-2
Planning 3-2
Preparing 3-3
Collecting Obstacle Intelligence 3-3
Executing 3-4
Engineer Integration into the Force 3-4
Task Force In-Stride Breach Scenario 3-6

CHAPTER 4. DELIBERATE BREACH 4-1
Deliberate Breaching Fundamentals 4-1
Suppress 4-1
Obscure 4-3
Secure 4-3
Reduce 4-4
Task Force Deliberate Breach 4-4
Planning 4-4
Preparing 4-5
Collecting Obstacle Intelligence 4-5
Executing 4-6
Continuing the Attack 4-11
Brigade Deliberate Breach 4-11
Task Force Deliberate Breach Scenario 4-11

CHAPTER 5. ASSAULT BREACH 5-1
Nature of the Assault 5-1
Assault Breaching Fundamentals 5-1
Suppress 5-2
Obscure 5-2
Secure 5-2
Reduce 5-2
Engineer Integration into the Assault Force 5-2
Consolidation 5-3
Heavy Company Team Assault Breach Scenario 5-3
Light-Heavy Task Force Assault Breach Scenario 5-3

CHAPTER 6. COVERT BREACH 6-1
Covert Breaching Fundamentals 6-1
Suppress 6-1
Obscure 6-2
Secure 6-2
Reduce 6-2
Task Force Covert Breach 6-2
Planning 6-2
Preparing 6-3
Task Force Covert Breach Scenario 6-3

CHAPTER 7. BREACH TRAINING 7-1
Assessing Unit Needs 7-1
Integrating Breach Training 7-1
Using Mission Training Plans (MTPs) 7-1
Training the Types of Breaches 7-4
Conducting Training Exercises 7-4
Using the Combined Arms Live-Fire Exercise 7-10

APPENDIX A. SOVIET OBSTACLE WARFARE A-1

APPENDIX B. INTELLIGENCE PREPARATION OF THE BATTLEFIELD B-1

APPENDIX C. OBSTACLE REDUCTION TECHNIQUES C-1

APPENDIX D. BREACHING REHEARSALS D-1

APPENDIX E. BREACH LANE MARKING E-1

GLOSSARY Glossary-1

REFERENCES References-1

INDEX Index-1

Preface

SCOPE

This manual outlines the Department of the Army (DA) doctrine for combined arms breaching operations. Fighting as a combined arms team is imperative to breaching success and is the centerpiece of the manual. The manual begins with a discussion of the breaching challenges facing the commander on a modern battlefield where maintaining freedom to maneuver is mission-essential. The theory behind breaching operations is then outlined to equip the commander with the fundamentals needed to integrate a breach into his tactical planning, preparation, and execution. Subsequent chapters discuss in detail the various types of breaching operations available to the commander: in-stride, deliberate, assault, and covert. The focus of these chapters is what drives the commander to decide what type of breach to plan and prepare for and to execute based on mission, enemy, terrain, troops, and time available (METT-T). Breach training is vital to our Army's preparedness for combat. Therefore, an entire chapter is devoted to integrating breach training into unit training plans. Lastly, this manual provides supplemental information on Soviet obstacle warfare, intelligence preparation of the battlefield (IPB), and obstacle reduction techniques.

PURPOSE

This manual provides combined arms commanders, from company to brigade, and their staffs with the doctrine, tactics, and techniques needed to successfully overcome obstacles. It provides the commander with breaching fundamentals and information for planning, preparing, and executing the in-stride, deliberate, assault, and covert breaches. This manual gives the coordinating and special staff officer a basis for synchronizing all combat multipliers during a breach. This manual serves as a source of information for non-DA planners who may be involved in operating with ground forces conducting offensive operations.

USER INFORMATION

The proponent of this publication is HQ TRADOC. Send comments and recommendations on DA Form 2028 (Recommended Changes to Publications and Blank Forms) directly to Commandant, US Army Engineer School, ATTN: ATSE-TDM-P, Fort Leonard Wood, MO 65473-6650.

This publication implements the following international agreement: STANAG 2889, *Marking of Hazardous Areas and Routes Through Them, Edition 3.*

Unless this publication states otherwise, masculine nouns and pronouns do not refer exclusively to men.

Chapter 1
Challenge to Maneuver

AirLand Battle is a battle of maneuver. It requires initiative, agility, depth, and synchronization—all of which depend on freedom to maneuver. Terrain conditions and enemy offensive and defensive tactics integrate fires, maneuver, and obstacles to destroy our maneuver capability.

Existing terrain can severely limit movement and maneuver. Mechanized forces are limited in movement by steep slopes, vegetation, dry and water-filled gaps, rocks, and a variety of other natural and man-made obstacles. Maneuver is restricted even more than movement. Successful maneuver is dependent on the ability of the maneuver commanders to use the terrain to move and deploy their subordinate elements into tactical formations.

Successful enemy tactics specifically use fires, existing terrain, and man-made obstacles to strip our freedom to maneuver. To counter this threat, friendly maneuver commanders must be able to mass combat power at a critical time and place and overcome any man-made obstacles. The most severe obstacle threat that the United States (US) forces face is a well-trained Army modeled on Soviet forces and employing Soviet obstacle tactics. This type of enemy, therefore, is the challenge that combined arms breaching operations (described in this manual) must overcome.

Soviet regiments and higher echelons have organic capability to rapidly prepare ditches, wire obstacles, minefields, and other obstacles. The Soviets have built their doctrine on past experience. They rely heavily on the minefield as the primary obstacle, remembering the decisive role of mine warfare in World War II (WWII) that the following example serves to illustrate:

In the latter half of December 1944, forces of the Third Ukrainian Front made a forced crossing of the Danube River south of Budapest, broke through the Germans' prepared defense, and threw the German forces back 50 to 80 kilometers to the west. In Budapest, 180,000 German troops were surrounded. In the last few days of December, the Fourth Guards Army met sharply growing German resistance while attacking north and west. On 30 December, elements of the 5th and 3rd SS Panzer Divisions concentrated near Komarno and built crossing sites on the Danube River. Russian reconnaissance indicated that the Germans were preparing an attack to relieve Budapest.

In the face of the impending attack, the Fourth Guards Army shifted to the defense. Forward units organized into strongpoints and centers of resistance covering the most important avenues of approach. They covered gaps between strongpoints with direct fires and night patrols.

Although preparations were conducted in continuous contact with the Germans, the defense was prepared quickly. By the end of 1 January 1945, the Fourth Guards Army had prepared 39 antitank strongpoints with 523 guns (5 to 30 guns in each position). Divisions completed a strong antitank defense, created reserves, and secured unit boundaries and flanks.

Strict priorities were set for obstacle and fortification work. Fifty percent of the fighting strength of the first echelon and all personnel from the second echelon were involved in this effort. Combat engineer battalions from the Army combat engineer brigade formed mobile obstacle detachments. Each detachment carried 2,000 to 2,500 mines, which accounted for 79 tank and 12 armored personnel carrier kills in the subsequent battle.

During the operation, the commander maintained a strong reserve. The antitank reserve consisted of up to four tank destroyer regiments and included self-propelled artillery regiments during crucial parts of the battle.

The defensive preparations over the two-day period, 30 December to 1 January, allowed the Soviets enough time to prepare an echeloned, fortified defense linking strongpoints and obstacles to soundly defeat a numerically superior German armored force.

Soviet analysis of historical experience has resulted in a doctrine to thwart the ability to maneuver. In the defense, the Soviets use all available assets to prepare obstacles and fortifications. They will usually dedicate ditching assets to prepare vehicle fighting positions and trenches, although they will sometimes prepare antitank (AT) ditches. The Soviets rely most heavily on minefields for tactical obstacles and use wire obstacles to reinforce fortifications and protective obstacles near strongpoints. *Appendix A* presents Soviet obstacle techniques in more detail.

Soviet offensive strategy consists of a fluid battlefield characterized by a series of meeting engagements and deep thrusts. They use mobile obstacle detachments called Podvizhnyy Otryad Zagrazhdeniya (POZs) to provide rapid-response, flank, and counterattack protection, emphasizing the use of mines in the offense. The Soviets consider rapidly emplaced minefields, integrated with their AT reserve, to be their primary protection against counterattack.

Figure 1-1 illustrates a POZ rapidly emplacing a minefield to protect the flank of a Threat force conducting a flank attack from the march. This minefield helps secure the enemy's flank by attacking the friendly force's freedom to maneuver for a counterattack.

Location and type of obstacle effort during a meeting engagement is an excellent indicator of enemy intentions. Rapid mining across the front of a Threat force indicates a shift to a hasty defense. Lack of follow-on effort to dig in surface-laid minefields indicates that the halt is temporary and that the Threat force intends to resume the offensive through their minefields.

The Soviets carry sufficient mines to implement this doctrine. Divisions in the offense carry large quantities of both antipersonnel (AP) and AT mines.

They have fielded minelayers that move with maneuver units to quickly place flank and defensive minefields (see *Appendix A, Table A-1*). Helicopters, fixed-wing aircraft, and the BM-22 multiple-rocket launcher can deliver other scatterable mine (SM) systems which can be used in interdictory and area-denial roles. The Soviets are developing additional methods of remote minelaying, including air and artillery delivery.

Friendly attacking forces must consider Soviet obstacle-emplacement capability when examining the enemy situation in the command estimate process to determine the priority intelligence requirements (PIR) and to develop a reconnaissance and surveillance (R&S) plan. The Soviets in a defensive posture will emplace protective and tactical minefields, trenches, and wire obstacles to support strongpoints. Antihandling devices suggest that the Soviets intend to remain in a defensive position for more than a few hours. *Figure 1-2* illustrates a typical motorized rifle platoon (MRP) obstacle array in support of a motorized rifle company (MRC) strongpoint. AP mines and antihandling devices suggest that the Soviets intend to remain in a defensive position for more than a few hours.

Soviet doctrine uses the mine as a means of slowing the enemy until sufficient direct and indirect fires may be brought to destroy or deter it. The Soviets have equipment to bury mines but will surface-lay them to speed emplacement and retrieval time for a hasty defense. This also enables them to put in effective dummy minefields.

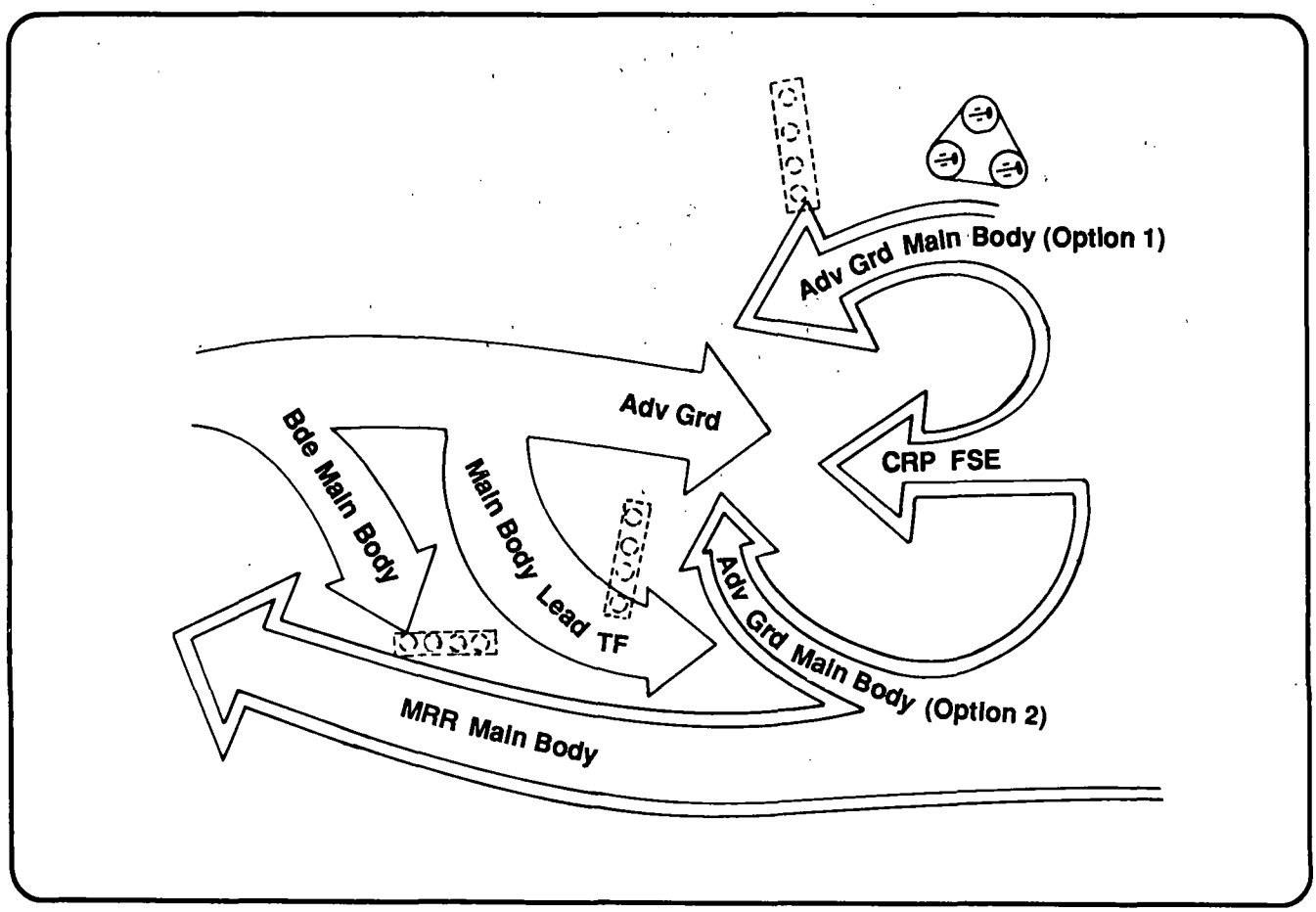


Figure 1-1. Soviet use of obstacles in a meeting engagement.

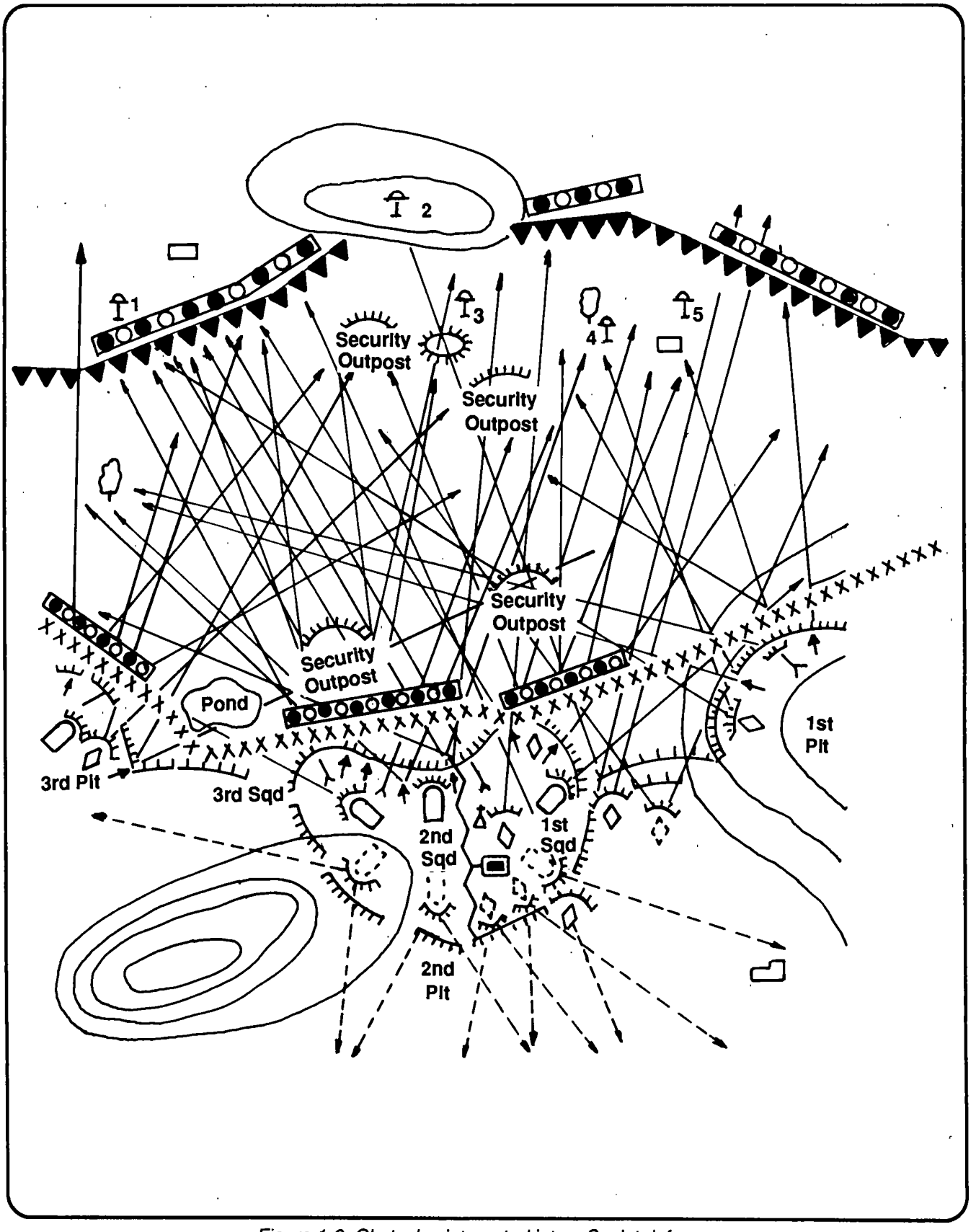


Figure 1-2. Obstacles integrated into a Soviet defense.

Where possible, the Soviets tie obstacles into the terrain to increase an attacker's difficulties. For example, minefields placed adjacent to a streambed or AT ditch require the crossing force to not only breach the minefield but also to clear sufficient lanes to allow other equipment to breach the gap. These complex obstacles require attacking forces to deal quickly with a variety of obstacle situations.

Obstacles are closely integrated with the fire plan—always in range and sight of direct-fire weapons. Integrating obstacles with direct fires provides a combination of kills that is far greater than either could get alone. The Soviets in a prepared defense expect to kill 56 percent of the combat vehicles (30 of 53 fighting vehicles in a balanced task force (TF)) that attempt to "bull through" a minefield.

This kill rate was verified in the Armored Platoon Effectiveness Test (ARPET) conducted by the Combat Development Experimentation Center at Fort Ord, California, in 1985. The results of this test conclude that units encountering minefields and fires will account for 50 to 75 percent of the tank kills in a future European war.

In addition to direct fires and obstacles, indirect fires play a major role in the fire plan. The Soviets plan to mass high volumes of artillery fire on obstacle complexes in fire sacks. Preplanned fires can arrive on target within minutes from the time the fire is called and can be adjusted on the breaching location rapidly. This artillery greatly complicates breaching operations, since it can fire any conceivable mixture of high explosives (HEs), improved conventional munitions (ICMs), and flechette rounds. Artillery will cover both obstacles and bypasses.

Flank obstacles not covered by direct ground fires may be covered by tactical aviation or helicopters to thwart counterattacks.

In addition to Threat tactical, protective, and natural obstacles, previously emplaced friendly and allied minefields and obstacles present obstructions to counterattacks, envelopments, and deep attacks. Soviet minefields and other obstacles present a tremendous challenge to the maneuver capability so essential to successful execution of AirLand Battle doctrine. Friendly forces overcome obstructions to maneuver with breaching operations. Every attack mission includes breaching operations as maneuver-critical events with specified missions to subordinate elements. All forces, whether combat, combat support, or combat service support, must be able to handle the obstacles they encounter on the battlefield.

Chapter 2
Obstacle Breaching Theory

Obstacle breaching is the employment of a combination of tactics and techniques to project combat power to the far side of an obstacle. It is perhaps the single most difficult combat task a force can encounter. Understanding breaching theory is the first step to understanding breaching tactics. Breaching is a synchronized combined arms operation under the control of the maneuver commander. Maneuver units employ breaching operations which include bypass, in-stride, deliberate, assault, and covert.

Forces encountering obstacles either conduct a breaching operation or extract themselves by organic means. A unit will extract itself if the obstacle is not defended or to reduce casualties from fires. As an example, a tank platoon will use its tank-mounted plow to extract itself from a minefield.

"Bulling through" or forcing through is not a breaching operation. "Bulling through" is a desperate decision made when a commander must react immediately to extricate his force from an untenable position within an obstacle and no other breaching operations are possible. When the force is in a minefield receiving fires and taking heavy losses, the commander may decide to immediately force his way through the minefield rather than wait or withdraw.

Obstacle reduction is the physical creation of a lane through or over an obstacle. Normally, engineers and specialized equipment such as tank-mounted mine plows create lanes to reduce an obstacle. The lane can be created by either making or finding a pathway through the obstacle.

Proofing is verifying that a lane is free of mines by passing a mine roller or another mine-resistant vehicle through as the lead vehicle. This is only done when the risk of live mines remaining in the lane exceeds the risk of loss to enemy fires while waiting. As some mines are resistant to some breaching techniques (for example, magnetically-fused mines may be resistant to a blast from a mine-clearing line charge (MICLIC)), proofing should be done when time, threat, and mission allow.

A bypass is a route that avoids the obstacle. When a unit bypasses an obstacle, it physically changes its direction of movement to avoid the obstacle. This must be done with caution because it might play into the enemy's hand.

Obstacle clearing is the total elimination or neutralization of an obstacle. Clearing operations are not conducted under fire. They are usually performed by follow-on engineer forces.

Breaching actions are the "plays" that the unit will execute on contact with an obstacle. They are developed and rehearsed by the TF and company teams to synchronize and standardize the execution of breaching operations.

BREACHING TENETS

Successful breaching operations are characterized by the application of the breaching tenets. The tenets are—

- Intelligence.
- Breaching fundamentals.
- Breaching organization.
- Mass.
- Synchronization.

Intelligence

Battlefield success depends largely on the ability of the force commander to "see the battlefield." He must identify how the enemy is using the ground to minimize the risk of surprise. This is particularly true when attempting to counter enemy use of obstacles. The force commander does this by his IPB. The IPB process achieves success when all available intelligence-gathering assets are focused to obtain well-chosen and specifically tasked PIRs. Hard intelligence gathered by reconnaissance becomes the foundation for developing and revising the situation template. The situation template drives maneuver planning and decisions the commander must be prepared to make. The decision support template (DST) is used by the commander to convey these decisions in graphic form. It enables the commander and his staff to develop an effective plan.

Time-constrained planning requires rapid development of the enemy situation template. A minimal situation template, complete with templated obstacles, allows development of the initial event template and provides initial PIR for the intelligence collection plan. Adequate time for intelligence collection is critical to developing an accurate picture of the battlefield, yet time is normally in short supply. While templating is essential to focus the collection plan, too much time can be spent on templating at the expense of R&S.

In any operation where enemy obstacles can interfere with friendly maneuver, obstacle intelligence (OBSTINTEL) becomes a PIR. Finding enemy obstacles or seeing enemy obstacle activity validates and refines the intelligence officer's (US Army) (S2's) picture of the battlefield. OBSTINTEL helps him to determine enemy intentions and plans as well as the strength of his defenses. The force

engineer is the unit's expert on enemy countermobility. He assists the S2 in templating enemy obstacles and analyzing OBSTINTEL.

An unverified enemy template can lead to disaster. The force may aim the attack at the wrong place. Units may deploy to breach expected obstacles early, wasting mission time to "feel" their way into nonexistent obstacles, or they may blunder into an unexpected obstacle or fire sack. *Appendix B* discusses confirming and refining a situation template.

OBSTINTEL is a critical indicator to verify the enemy template. The force's operations and training officer (US Army) (S3), S2, and engineer establish effective OBSTINTEL collection by determining specific obstacle PIR. Examples of obstacle information needed to fulfill obstacle PIR include—

- Obstacle location.
- Obstacle orientation.
- Presence of wire.
- Gaps and bypasses.
- Minefield composition (buried or surface AT and AP mines, antihandling devices, and depth).
- Type of mines.
- Location of enemy direct-fire weapons.

OBSTINTEL is particularly important for discovering the types of mines and mine fuses the enemy has employed. The engineer depends on this information since he must determine which reduction techniques offer the best chance for success and minimize risk to the breach force. This requires a dismounted reconnaissance patrol to examine mines within the minefield (not just the first row because it may consist of AP mines only).

Obtaining OBSTINTEL requires all available collection assets. Aviation and ground surveillance radars are tasked to identify fortification and obstacle emplacement activity. Scouts, task-organized with engineers, conduct reconnaissance of likely obstacle locations identified through templating. Combat patrols probe bypasses and identify obstacles. Engineer patrols are tasked to obtain OBSTINTEL by supplementing scout reconnaissance. Specific collection taskings are detailed in the collection plan by identifying named areas of interest (NAIs) that focus reconnaissance on gathering information that confirms or denies the enemy template.

Reconnaissance is a combined arms activity. Reconnaissance forces include engineers when collecting OBSTINTEL. An engineer squad moves with the scouts or patrol and conducts dismounted reconnaissance of either templated or discovered obstacles. The engineers have the flexibility to detach and dismount sapper teams and to develop the details of the obstacle. This allows the scouts or patrol to concentrate on the overwatching force.

During a hasty attack, the engineer platoon conducts reconnaissance to assist a company team in developing the situation. TF commanders may also assign engineer platoon reconnaissance missions before a deliberate attack as part of the TF reconnaissance effort. The commander assigns engineer reconnaissance missions based on the type of engineer unit. Mechanized engineers are capable of covering numerous NAIs, but they cover them in little detail. They are adept at reconnoitering enemy tactical obstacles; however, they lack the stealth necessary to reconnoiter protective obstacles. Light engineers are capable of covering few NAIs, but they cover them in great detail. They can use stealth to gain detailed information on enemy protective obstacles. A combination of light and heavy engineers is the ideal obstacle reconnaissance force. The mechanized engineers use their mobility to reconnoiter numerous tactical obstacle NAIs while light engineers use stealth to reconnoiter protective obstacle NAIs.

Engineers engaged in reconnaissance for OBSTINTEL should rarely, if ever, be used to reduce obstacles during the reconnaissance (although they make ideal leaders for subsequent breaching operations). Inadvertent detonation during reduction may compromise the engineers and scouts, defeating the reconnaissance mission. It may also compromise the entire attack. The opportunity to exploit the breach requires a force prepared to act quickly and vigorously. The force must secure the lanes, employ suppressive direct and indirect fires, and attack before the enemy can react to destroy the reconnaissance elements and restore the integrity of its defense.

During the operation, any unit encountering an obstacle must quickly develop the situation to provide detailed information to the commander. This is a continuous requirement and supplements previous OBSTINTEL.

Breaching Fundamentals

Suppress, obscure, secure, and reduce (SOSR) are the breaching fundamentals that must be applied to ensure success when breaching against a defending enemy. These tactics and techniques will always apply but may vary based on specific situations.

Suppress. Suppression is the focus of all available fires on enemy personnel, weapons, or equipment to prevent effective fires on friendly forces. Suppressive fires include the full range of weapons from direct and indirect fires, electronic countermeasures (ECM), and directed energy. The purpose of suppression is to protect forces reducing and maneuvering through the obstacle and to soften the initial foothold (assault force objective).

Effective suppression is the mission-critical task during any breaching operation. Suppressive fires in sufficient volume (3:1 minimum) serve to isolate the breaching site. Successful suppression generally triggers the rest of the actions at an obstacle. Fire control measures are used to ensure that all fires are massed, lifted, and shift-synchronized with other actions at the obstacle.

Obscure. Obscuration hampers enemy observation and target acquisition and conceals friendly activities and movement. Obscuration smoke deployed on or near the enemy position minimizes its vision. Screening smoke employed in the breaching area or between the breaching area and the enemy conceals movement and obstacle-reduction activities. It also degrades enemy ground and aerial observation. Obscuration must be employed to protect obstacle reduction, passage of assault forces, and deployment of forces in assault formations.

Obscuration must be carefully planned to provide maximum degradation of enemy observation and fires, but it must not significantly degrade friendly fires and control. Terrain masking that obscures the breaching site is usually the only form of obscuration that is not a double-edged sword.

Secure. The force secures the breaching operation site to prevent the enemy from interfering with obstacle reduction and passage of the assault force through the lanes created during the reduction. Security must be effective against outposts and fighting positions near the obstacle and against overwatching units and counterattack forces. In general, enemy tactical obstacles are secured by fires, and protective obstacles are secured by force.

Identifying the extent of the enemy defenses is critical before selecting the appropriate technique to secure the breach. If defenders control the breaching site and cannot be adequately suppressed, the force must secure the breaching site by occupation before it can reduce the obstacle.

Reduce. Reduction means creating lanes through or over the obstacle to allow the attacking force to pass. The number and width of lanes created varies with the situation and type of breaching operation. The lanes must be sufficient to allow the force to cross and accomplish the mission. Lanes are handed over to follow-on forces. The unit reducing the obstacle will mark and report obstacle and lane locations and conditions to higher headquarters. Follow-on units will further reduce or clear the obstacle when possible.

Reduction cannot be accomplished until the other SOSR breaching fundamentals are applied and become effective. The force must synergistically isolate the breaching site and overwhelm the defender before reduction can proceed and the breach can be exploited.

Breaching Organization

The commander organizes the force to accomplish SOSR breaching fundamentals quickly and effectively. This requires him to organize support, breach, and assault forces with the necessary assets to accomplish their roles.

Support Force. The support force's primary responsibility is to eliminate the enemy's ability to interfere with the breaching operation. It must—

- Isolate the battlefield with fires and suppress enemy fires covering the obstacle.
- Mass direct and indirect fires to fix the enemy in position and to destroy any weapons that are able to bring fires on the breaching force.
- Control obscuring smoke to prevent enemy-observed direct and indirect fires. In a mechanized force, the support force is typically organized around tanks and improved tube-launched, optically tracked, wire-guided (TOW) vehicles (ITVs). However, the TF may also mass their air defense assets with the support force.

Suppression is critical for a successful breach; therefore, the first priority of force allocation is the support force. The commander allocates direct- and indirect-fire systems to achieve the support force ratio of 3:1 against the enemy for a deliberate attack. A ratio of 2.5:1 is required for a hasty attack. In short, an obstacle defended by a platoon requires a company team as a support force. An obstacle defended by a company requires at least two company teams in the support force.

The support force must rapidly occupy an attack-by-fire (ABF) position, seeking maximum protection from folds in the ground. It must follow a covered or concealed route to the support position; otherwise it may cross an enemy fire sack. Once the support force is deployed, it must rapidly develop and disseminate a fire plan designating sectors of fire and observation to ensure that all possible enemy positions are covered. Observation is particularly critical. Artillery observers with the support force initially bring indirect fires on enemy positions to fix them in place. They must also cue the artillery counterbattery system to prepare immediate counterbattery fires. The support force then adjusts the artillery-delivered obscuring smoke.

Breach Force. The breach force's principal mission is to create the lanes that enable the attacking force to pass through the obstacle and continue the attack. It is also responsible for marking the lanes along the lane's length and at entry points to speed passage of the assault and follow-on forces.

The breach force is a combined arms force. It includes engineers, breaching assets, and enough maneuver force to provide local security. The breach force also applies SOSR breaching fundamentals because it reduces the obstacle. Since the support force may not be in the position to effectively observe and suppress all enemy direct-fire systems, the breach force must be capable of providing suppressive fires. The breach force employs vehicle-mounted

smoke systems and smoke pots, if necessary, for self-defense and to cover lanes while the assault force is passing. The breach force secures itself from small threat forces providing short-range protection of the obstacle. After reducing the obstacle, the breach force may be required to secure a lodgement on the far side for deployment of the assault force into an assault formation.

The breach force must be able to deploy and begin reducing the obstacle as soon as enemy fires have been suppressed. It can expect enemy artillery fires within a matter of minutes.

The engineers with the breach force are allocated and organized by platoons with the breaching assets necessary to handle mines, nonexplosive obstacles, and small gaps. They are also capable of reducing the obstacle by finding local bypasses or existing lanes.

The commander allocates engineer platoons and equipment based on the number of lanes required. The breach force must be capable of creating a minimum of one lane for each assaulting company or two lanes for an assaulting TF. The commander should expect a 50-percent loss of mobility assets in close combat. Therefore, breaching a lane in close combat requires an engineer platoon in the breach force.

Once the breach force has reduced the obstacle and passed the assault force through, it will hand over the lane to follow-on units. At a minimum, the lanes must be marked and their locations and conditions reported to higher headquarters and follow-on units as prescribed in the unit's standing operating procedure (SOP).

Assault Force. The assault force's primary mission is to destroy or dislodge the enemy on the far side of the obstacle. It secures the far side by physical occupation in most deliberate or light-force breaching operations. The assault force may be tasked to assist the support force with suppression while the breach force reduces the obstacle.

If the obstacle is defended by only a small force, the assault force mission may be combined with the breach force mission. This simplifies command and control and provides more immediate combat power for security and suppression. The commander must ensure that sufficient combat power will remain after accomplishing all breaching element missions to overcome the defender in the assault.

Fire control measures are essential, since both the support and breach force are firing on the enemy when the assault force is committed. Suppression of overwatching enemy positions must continue and other enemy forces must remain fixed by fires until the enemy has been destroyed or dislodged. The assault force must assume control for direct fires on the assault objective as support force fires are lifted or shifted.

The assault force must be sufficient in size to seize objectives that eliminate fires on the breaching site. Combat power is allocated to the assault force to achieve a 3:1 ratio on the assault objective. In the deliberate breach, the assault force maneuvers as a separate force attacking through the breached obstacle. However, the breach and assault assets may maneuver as a single force when conducting an in-stride breach.

Mass

Breaching is conducted by rapidly applying concentrated force at a point to crack the obstacle and rupture the defense. Massed combat power is directed against an enemy weakness. The location selected for breaching depends largely on a weakness in the enemy defense where its covering fires are minimized. If the attacker cannot find a natural weakness, he creates one by fixing the majority of the defending force and isolating a small portion of it for attack. The isolated portion is then suppressed to eliminate effective fires on the breach forces. Smoke and terrain are used to assist in isolating the force under attack. Suppression requires the commander to mass enough overwatching direct fires to achieve at least a 3:1 firepower ratio.

Normally, a TF isolates and destroys motorized rifle platoons in succession, starting with the platoon identified as the easiest to overwhelm. In *Figure 2-1*, the TF commander employs a tank company team to fix two defending platoons and uses screening smoke to assist in isolating the platoon selected for attack. This platoon is suppressed by direct fires from a second tank company team (with more than a 3:1 ratio of fires) as well as by indirect fires.

The commander also masses his engineers and breaching equipment to reduce the obstacle. The breach force is organized and equipped to use several different reduction techniques in case the primary technique fails (a key vehicle is destroyed or casualties render dismounted engineers ineffective). Additional reduction assets are present to handle the unexpected. Normally, 50 percent more than required are positioned with the breach force.

Achieving necessary mass for the assault requires the breach force to open enough lanes through the obstacle to permit rapid passage and the buildup of forces on the far side. A mounted TF requires at least two lanes to allow two companies to pass simultaneously in column while minimizing lateral movement. A dismounted assault force requires one lane for each leading assault platoon. The tactical situation may require additional lanes to quickly pass a large assault force through the obstacle to achieve a sufficient combat power ratio.

The breach force masses reduction effort against the obstacle to ensure that it will successfully breach enough lanes. A mounted TF requires at least two lanes, but more will speed passage through the danger area (see *Figure 2-1*). The breach force will attempt as many simultaneous

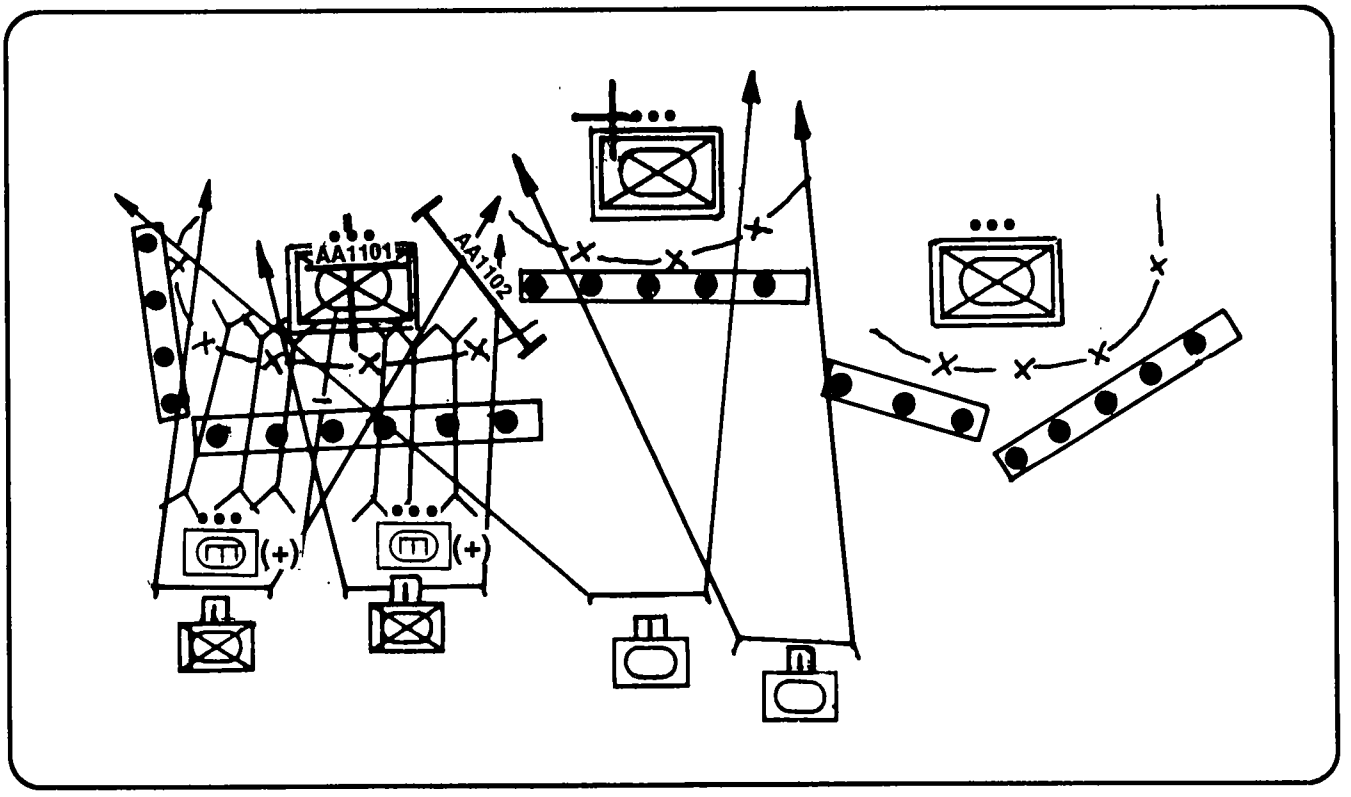


Figure 2-1. Achieving mass in the breach.

breaches as possible to ensure that at least two are successful and will continue to create more lanes within its capability. This normally results in the breach force simultaneously using a combination of mechanical and manual techniques.

To illustrate, an engineer platoon may use a pair of MICLICs as the primary technique to breach a minefield. As soon as the engineer platoon fires the second MICLIC, the engineer squads employ manual explosive techniques to push three additional lanes through the minefield. The lanes are spaced at least 100 meters apart to reduce artillery effects. The MICLIC firings will attract enemy artillery fires to the lane location, minimizing risk to the dismounted breach squads. If plow tanks are available, they would be plowing lanes either alongside or in place of the dismounted engineer squads.

The TF engineer must balance the need for massing his breaching assets to attack the current obstacle against the need for those same assets to attack subsequent obstacles. He must retain a breaching capability up through the assault of the defending position.

The principle of mass influences the selection of the breaching location of task organization of the support, breach, and assault forces and integration of the engineers in force movement or attack formations.

The need to generate enough mass strongly influences which echelon can conduct a breaching operation. A company team generally cannot simultaneously mass sufficient fires, breach the obstacle, and also assault the defending position unless it is a simple obstacle defended by no more than a squad. A TF has sufficient combat power to attack an obstacle defended by a company and is normally the echelon used to execute a breach. The brigade has sufficient combat power to attack a complex and well-defended obstacle but has difficulty deploying all its combat power within range. Normally, the brigade breaches by isolating a small segment of the defense (platoon or company) that a TF can then attack as the breaching echelon. If the obstacles and defenses are in-depth, mass is achieved by passing additional TFs through to continue the attack.

Synchronization

Breaching operations require precise synchronization of the SOSR breaching fundamentals by support, breach, and assault forces. Failure to synchronize effective suppression and obscuration with the obstacle reduction and assault can result in rapid, devastating losses of friendly troops in the obstacle or in the enemy's fire sack.

The commander cannot adequately synchronize his force's application of combat power in the short time available to him when he encounters an obstacle. The number of decisions that he must make while under fire in an unclear

situation will rapidly overwhelm him. Even with a force trained to execute a combined arms breach, synchronizing all necessary tasks remains a complex and difficult process.

The combined arms breach is a complex operation by nature. The SOSR breaching fundamentals must be applied by support, breach, and assault forces within a short time and distance. The support force masses its direct fires and controls indirect fires in concert with breach and assault force maneuver. The commander must employ smoke at just the right time and place to maximize its effectiveness or risk hampering his own target acquisition and command and control. The breach force must have the right breaching tool for the type of obstacle encountered. The engineer must be sensitive to premature exhaustion of breaching equipment needed to punch through subsequent obstacles. *Table 2-1* illustrates the complexity of the combined arms breach. It

Table 2-1. Breach complexity.

Action	Element	Time (Minutes)	Controlled By
Develop situation (Verifying boundary of enemy obstacle system)	Force in contact	M to 2	S3
Maneuver support force into overwatch position	Support	M +2 to 15	Support CDR
Maneuver assault force into covered assault position	Assault	M + 2 to 15	Assault CDR
Call for artillery	DS artillery	M + 2 to 15	FSO
Build smoke	Mortars	M + 5 to 10	FSO
Suppress enemy with direct fires	Support	M + 15 to 29	Support CDR
Suppress enemy with artillery fires	DS artillery	M + 10 to 29	FSO
Maintain smoke	DS artillery/mortars	M + 10 to 30	FSO
Maneuver breach force to breach location	Breach	M + 20 to 23	Breach CDR
Reduce obstacle Prepare two lanes	Breach	M + 23 to 30	Engineer leader
Place smoke pots	Breach	M + 23 to EOM	Breach CDR
Shift direct fires off of OBJ	Support	M + 29 to 30	Assault CDR
Shift indirect fires beyond OBJ	DS artillery	M + 29 to 30	Assault CDR
Assault to destroy enemy on far side of obstacle	Assault	M + 30 to 45	Assault CDR
Reorganize to continue mission	TF	M + 45 to EOM	S3

M = contact with obstacle

portrays the multiple, time-sensitive actions that typically occur. The rehearsal of these specific responsibilities allows the commander to synchronize the breaching operation.

The commander ensures synchronization through proper planning and force preparation. Fundamentals to achieve synchronization are—

- Detailed reverse planning.
- Clear subunit instructions.
- Effective command and control.
- A well-rehearsed force.

Synchronizing the combined arms breach begins by using the reverse planning process to ensure that actions at obstacles support actions on the objective. Planning a breach without regard to actions on the objective leads to disaster. A commander first decides how he must attack an objective to accomplish his mission. This decision drives where, how, and with what force he must support, breach, and assault through the enemy's obstacles. The commander designs a scheme of maneuver for the breaching phase of the operation that achieves adequate suppression, obscuration, and security. The commander also creates sufficient lanes to rapidly project combat power on the objective, not just to the far side of the obstacle. Reverse planning gives purpose to a breaching plan that supports accomplishing the mission.

The commander begins planning by analyzing the objective and allocating forces to accomplish his mission. He then develops actions on the objective to employ his combat power. In *Figure 2-2*, a TF is conducting a deliberate attack to destroy an MRC in the defense. The commander believes seizing objective (OBJ) C to be decisive. This is the point from which reverse planning actions on the objective begins. The commander uses Team B to seize the initial foothold (OBJ B) into the enemy's defense; getting Team B to its objective becomes the focus of breach planning. The number and location of breaching lanes is driven by Team B's maneuver on OBJ B as the assault force. The commander now plans how team engineers, as the breach force, must maneuver during the breaching phase of the attack to reduce the obstacle. Supporting fires from Company A and Team D in ABF position 15 are planned to support both the breach

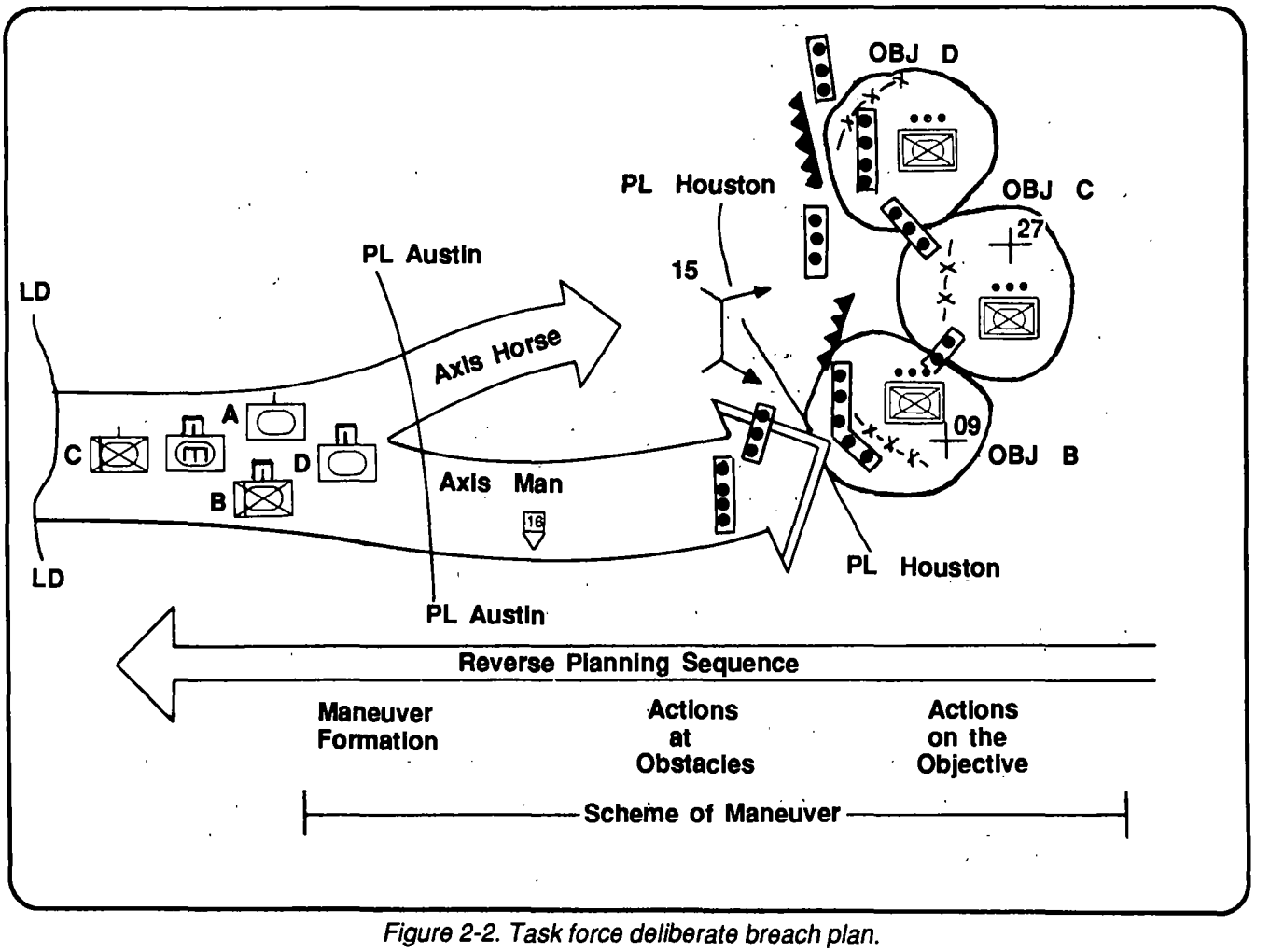


Figure 2-2. Task force deliberate breach plan.

and the attack on the objective. Lastly, reverse planning continues to drive the maneuver formation to ensure that forces are in the correct relative positions to accomplish their breaching roles and actions on the objective.

Subordinate units must clearly understand their missions, how they relate to the phases of the operation, and what role adjacent units play in the overall plan. The commander uses the execution matrix to relate subunit instructions to phases of the operation. The execution matrix is a superb synchronization tool. It lists subunit instructions sequentially in relation to key events or phases of the attack. The execution matrix provides subordinate commanders with an understanding of how their missions and those of adjacent units fit into the overall plan. More importantly, the matrix allows subordinates to better track the battle and coordinate their own maneuver with that of adjacent units. This is critical to achieving unity of effort between support, breach, and assault forces. *Figure 2-3* shows an example execution matrix for the scheme of maneuver in *Figure 2-2*.

Effective command and control is paramount to synchronization. Command and control is integrated into the plan through the use of maneuver control measures and the positioning of key leaders to see the battle. Maneuver control measures enable the commander to graphically convey his intent, scheme of maneuver, and subunit instructions on the map. Relating subunit actions to the terrain is critical to successful execution.

In *Figure 2-2*, the commander uses phase lines (PLs) to initiate the breach and actions on the objective; at PL Austin, the support force splits from the TF to occupy ABF position 15. The assault force occupies checkpoint (CP) 16 to prevent premature advance to the obstacle, breaching site congestion, and being engaged before lanes are cleared. An ABF position is designated to position the support force. The commander uses target reference points (TRPs) on obvious terrain features to orient, focus, and shift suppressive direct and indirect fires.

Key leaders must be able to see the battle in order to make informed decisions. Nowhere is this more true than during a breaching operation. The commander must position himself where he can best control the battle. Since effective suppression is the most critical event during breaching, the commander usually positions himself with the support force. This enables him to personally influence the control of fires and facilitate the necessary cross talk between breach and assault forces. The S3 may initially move with the breach force to track the progress of obstacle reduction and anticipate the commitment of the assault force. The commander who feels his personal influence is required with the breach or assault force must make a conscious effort to maintain track of the entire battle and not get focused on the breach or assault itself.

The most effective synchronization tool available to the commander is the rehearsal. The inherent complexity of a breaching operation makes rehearsals at every level essential to success. The commander must afford his subordinates the time to plan how they will execute their assigned missions and to rehearse that plan with their unit. A TF facilitates rehearsals by preparing rehearsal sites for use by company commanders and managing site usage. The TF commander must be sensitive to the impact TF-level rehearsals have on the subordinate planning and preparation. He must carefully choose the time and place of the rehearsal. Breaching operations are part of every rehearsal. Company teams rehearse immediate action breaching drills as well as their support, breach, and assault roles. TF rehearsals focus on synchronizing the maneuver of support, breach, and assault forces to achieve the SOSR breaching fundamentals and highlight key events that must be coordinated during breach execution.

MANEUVER

Breaching operations make maneuver possible in the face of enemy obstacle efforts. Since obstacles may be encountered anywhere, maneuver forces integrate breaching operations into all movement plans.

Types of Breaching Operations

In-stride breaching is a very rapid technique using standard actions on contact and on normal movement techniques. It consists of preplanned, well-trained, and well-rehearsed breaching actions and reduction procedures by predesignated combined arms elements. The in-stride breach takes advantage of surprise and initiative to get through the obstacle with a minimal loss of momentum. The force uses the in-stride breach against either weak defenders or very simple obstacles and executes it from the march. Subordinate forces always move configured to execute an in-stride breach with organic and task- organized assets (except when a deliberate breach is planned). *Chapter 3* discusses the in-stride breach.

The maneuver force attacks a stronger defense or more complex obstacle system with a deliberate breach. It is similar to a deliberate attack, requiring detailed knowledge of both the defense and the obstacle system. Subordinate elements are task organized to accomplish the breach, and they receive specific missions and objectives for it. The breach often requires securing the far side of the obstacle with an assault force before or during reduction. Deliberate breaching operations require significant planning and preparation. *Chapter 4* discusses the deliberate breach.

The maneuver force uses an assault breach to break a dismounted force through enemy protective obstacles onto the enemy position. Depending on the size and difficulty of the defensive obstacle system, the assault

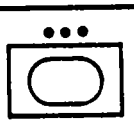
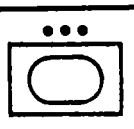
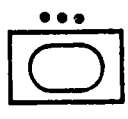
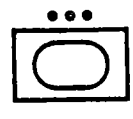
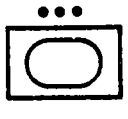
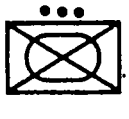
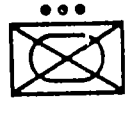
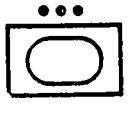
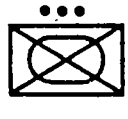
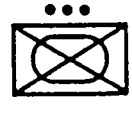
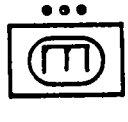
Units	Company A	Team B	Company C	Team D	Team Engineer	Force Allocation
						
						
						
						
Phase						
LD PL Austin	Echelon left Team D	Echelon right Team D	Trail Team Engineer	Lead TF	Trail Team D center	**Maneuver Formation**
PL Austin	Axis Horse OCC ABF 15	Axis Man CP 16	Trail Team B	Lead Axis Horse OCC ABF 15	Lead Axis Man	
Breach	ABF 15 Orient TRP 09 O/O 27	OCC CP 16 Identify breach	OCC PL Austin	ABF 15 Orient TRP 09	Lead Axis Man Breach 2 lanes	**Breach**
OBJ B	Shift fires TRP 27	O/O move thru breach Seize OBJ B	OCC CP 16 Identify breach	Shift fires TRP 27	Assist passage of Team B	
OBJ C	Shift fires to OBJ D	ABF on OBJ C Lift O/O	O/O move thru breach Seize OBJ C	OCC CP 16 Identify lanes	Assist passage of Company C	
OBJ D	Lift fires Consolidate ABF 15	Consolidate OBJ B	ABF on OBJ D Lift O/O	Seize OBJ D	Consolidate CP 16	**Action on OBJ**
Consolidate	ABF 15 Orient north	OBJ B Orient east	OBJ C Orient east	OBJ D Orient north-east	CP 16	

Figure 2-3. Execution matrix.

breaching procedure can be a variation of either deliberate or in-stride breaching techniques. The nature of enemy protective obstacles and the assault phase of an attack requires a separate type of breaching operation. The assault breach is outlined in *Chapter 5*.

Light and dismounted forces use covert breaching operations to pass secretly through obstacles. The covert breach also uses elements of the deliberate or in-stride breach. Surprise is the primary consideration that drives the commander to a covert breach. Covert breaching centers around using stealth to reduce the obstacle with support and assault forces only executing their mission if reduction is detected.

Movement

The commander executes a planned or unplanned breaching operation. If he has identified obstacles or the possibility of obstacles before his force moves, he develops a breaching plan. If the force stumbles across an unexpected obstacle, it will execute an unplanned breaching operation. This does NOT mean the force executes a spontaneous, unsynchronized breaching operation. It simply executes a rapid action on contact that it has planned and rehearsed for this eventuality.

Situation Clear. The commander carefully plans breaching operations when he anticipates encountering enemy defenses and obstacles. Before the move, the IPB process produces situation templates that are verified by R&S. The results of IPB feed into the decision-making process.

If insufficient obstacle information is available to prepare detailed breaching plans, the force will handle any obstacles encountered with in-stride breaching operations.

If information indicates a weak or weakly defended obstacle, the commander may elect to employ in-stride breaching techniques based on METT-T analysis and other force requirements. The support force must have at least a 3:1 fire advantage over the defender, and breaching assets with the breaching element must be sufficient to reduce the obstacle in less than 10 minutes.

If information indicates a strong or strongly defended obstacle, the commander will develop a detailed plan to employ a deliberate breaching operation. He bases this plan on METT-T analysis, which will significantly influence task organization. He assigns specific missions to subordinate units, and they conduct detailed rehearsals.

If the commander has planned to employ a deliberate breach against a known obstacle and the force encounters unexpected obstacles, he still employs the decision procedures for unplanned breaching against them.

Situation Unclear. Unplanned breaching occurs when the force is surprised. Information is either acquired from leading security elements or (worst case) by lead elements enmeshed in the obstacle. In either case, the force extricates itself and develops the situation to generate enough information for the commander to make a decision. If available, engineers with the engaged element conduct a rapid obstacle reconnaissance. Follow-on forces immediately move into ABF positions to help extricate the lead element and to allow rapid transition to a deliberate breach, if that is the commander's decision.

If the obstacle is weak or weakly defended, the lead company will attempt an in-stride breach during the development of the situation. Since the support force must have at least a 3:1 firepower advantage, the defender cannot be more than a platoon.

If the obstacle is weak or weakly defended but too strong for the lead company, the TF conducts an in-stride breach. In order to maintain a 3:1 advantage, the TF can only conduct an in-stride breach against a defending enemy company.

If the in-stride breach fails or information indicates the obstacle and defenses are too strong for a TF in-stride breach to overcome, the TF will halt and prepare a deliberate breach. If the TF has insufficient combat power, the brigade may instead isolate a breaching area and pass another TF through to conduct a deliberate breach.

Continued Movement. After the TF passes through the obstacle, the commander reorganizes the force and determines if the force has enough combat power to continue the attack. The commander also redistributes breaching assets for follow-on breaching operations. He may have to designate new support, breach, and assault forces. He reports the breached obstacle to higher echelon and follow-on units and hands the lanes over to follow-on forces. *Table 2-2* shows a typical type of breaching operation versus the size of the enemy force overwatching the obstacle. This does not take into account a maneuver force being able to isolate the battlefield.

PLANNING SEQUENCE

In summary, breach planning is driven by two fundamental thought processes—the command and engineer estimates. Both estimates begin by identifying enemy and friendly strengths and weaknesses. The engineer and command estimates merge in the development of the situation template. Scheme of maneuver, actions at obstacles, and scheme of engineer operations are all based on the same situation template. The command and engineer estimates use the sequence below to develop a breaching plan.

- Reverse planning begins with actions on the objective.
- Actions on the objective drive the size and composition of the assault force.
- Actions on the objective determine the number and location of lanes to be breached.

- Lane requirements and the type of obstacle drive the amount and type of mobility assets task organized to the breach force.
- Ability of the enemy's infantry to interfere with the breach determines whether the breaching site is to be secured by fires or by force.
- Ability of the enemy to mass fires at the breaching site determines the amount of suppression that is required. This determines the size of the support force.

The commander's intent merits special consideration in breach planning. His main effort must be clear and must be supported by the scheme of engineer operations. The engineer must plan to shift engineer forces and equipment consistent with the commander's main effort. The shift of engineer assets is particularly critical in successive breaching operations. Breach planning must be sensitive to the risk the commander is willing to accept in order to maintain mass and momentum.

Table 2-2. Types of breaching operations versus enemy size.

Maneuver Unit	Instride	Deliberate	Assault	Covert	Enemy Size Overwatching Obstacles
Brigade	X X	X ✓	X	X	MRB MRC MRP
Task Force	X	X ✓	X	X X	MRB MRC MRP
Company		X	X	X X	MRB MRC MRP

X - Type of breach normally conducted.
✓- Possible variation depending on scheme of maneuver.

Chapter 3
In-Stride Breach

The in-stride breach is a special type of breaching operation used by maneuver brigades and TFs to quickly overcome unexpected or lightly defended tactical obstacles. Brigade and TF commanders plan and prepare their force for an in-stride breach by task organizing subordinate TFs or company teams with the forces necessary to conduct independent breaching operations. The actual breach is conducted at the subordinate level. The subordinate commander designates specific support, breach, and assault forces based on his task organization. He is also responsible for synchronizing the SOSR breaching fundamentals through his own detailed breach planning or well-rehearsed immediate action drills. In short, the in-stride breach tactic enables a TF to seize and maintain the initiative through simple, decentralized, independent breaching operations conducted under the responsive command and control of company team commanders.

A commander is driven to organize his force for an in-stride breach when—

- An unclear situation (including enemy and friendly obstacle locations) makes it necessary for several lead subordinate units to be capable of independent breaching operations to accomplish the mission.
- The enemy defense (obstacles and fires) is so weak that the forces necessary to support, breach, and assault can be reasonably task organized into a subordinate unit and do not require the maneuver of other subordinate units to adequately suppress, secure, or reduce the obstacle.

In either case, the commander relies on his subordinates to organize for and synchronize the SOSR breaching fundamentals. In-stride breach planning, therefore, focuses on allocating sufficient support, breach, and assault forces to subordinate TF or company team commanders. Specific actions at obstacles are planned, rehearsed, and executed at the subordinate's level and do not involve the entire force, thereby maintaining momentum. The commander planning for an in-stride breach must consider missions for his maneuver and engineer forces that allow quick transition to a deliberate breach should attempts at an in-stride breach fail.

IN-STRIDE BREACHING FUNDAMENTALS

Force allocation is not limited to combat and engineer forces. It includes allocating priority of artillery and mortar fires, close air support, air defense coverage, and smoke targets and generators. The commander planning an in-stride breach develops a scheme of indirect fires, smoke employment, and air defense coverage based on the IPB that shifts priority to the unit that will most likely encounter obstacles. Synchronizing the employment of the assets still remains the subordinate commander's responsibility. The discussion below concentrates on how the commander applies the SOSR breaching fundamentals using force allocation in a TF in-stride breach. The same principles apply to the brigade in-stride breach where the commander allocates forces and resources to TFs; the only difference is the amount, type, and diversity of forces available.

Suppress

The key to any successful breach is quick and accurate suppression. The TF commander organizes his force for an in-stride breach by allocating sufficient maneuver platoons to deal a lethal volley of direct fires. The TF commander gives the priority of indirect fires to the company team most likely to encounter an obstacle. The commander may split allocation of indirect suppression between two lead company teams by giving priority of artillery to one company team and priority of mortars to another. When maneuvering in a bounding or traveling overwatch, priority of fires shifts to the forward or bounding unit.

When the situation is unclear, company teams must be organized with a balance of weapons that are able to rapidly suppress both an armor and dismounted threat. The range of weapons must be compatible with the terrain. For example, an armor-pure force is not an appropriate in-stride organization when conducting a movement through a defile. Company teams must be balanced with Bradley infantry fighting vehicles (BIFVs) and infantry able to provide suppression into surrounding high ground—a death trap for an armor-pure force. Suppression is achieved through well-rehearsed company and platoon actions-on-contact drills, and calls for immediate suppression of indirect fires.

If the size of the enemy force covering an obstacle is known or can be sufficiently templated, the commander allocates combat power to his subordinates to achieve a 3:1 advantage. Therefore, a TF can breach an obstacle in stride when the enemy covering the obstacle is platoon-sized or smaller. When the enemy strength is a platoon, priority of indirect fires using mortars and/or artillery targets is critical to ensure successful suppression. The commander allocates

priority targets to make indirect fires more responsive to company team execution. Targets are triggered by the PL and remain under the control of the company team fire support team (FIST) executing the breach for the TF.

Obscure

Obscuration is the most difficult resource to allocate for an in-stride breach. The TF mortars are the primary source of obscuring smoke. The TF allocates the priority of mortar fires to company teams most likely to encounter an obstacle. When the situation is unclear, the TF maneuvers the mortars by section so that one section is able to fire at all times. Smoke generators, when available, are employed to haze or screen the entire force, concentrating on where obstacle contact is most likely or most dangerous. At the company team level, obscuration is achieved through the use of on-board smoke as part of the company team immediate action drills.

Obscuration is less difficult when the situation is clear. The TF allocates smoke targets to the company team conducting the breach for the TF. The TF fire support officer (FSO) plans smoke targets to be executed under the control of the company team FIST. The mortar platoon or section is pre-positioned to fire the mission. The smoke targets are fired simultaneously with suppressive fires so that the smoke builds before the breach and assault forces move forward. Smoke is targeted and adjusted to obscure the breach without degrading direct-fire target acquisition by the support force. In unfavorable winds, smoke may be placed directly on the enemy position. Smoke generators are also positioned to establish a smoke line that specifically attacks the known or suspected enemy position.

The TF commander also considers the cover and concealment which an axis of advance offers his company teams during an in-stride breach. However, the commander must consider the mission and weigh the trade-off of using a more covered and concealed axis against rapidly moving his force.

Secure

Security for the in-stride breach is primarily achieved through effective supporting fires and the speed of the breach. Securing the far side by force slows company team momentum, strains company team command and control, and is an indication that the obstacle cannot be breached in-stride. However, the TF commander still allocates sufficient forces to his company teams to locally secure the obstacle reduction effort. The same force usually assaults the enemy position for an in-stride breach. When the situation is unclear, the forces needed to secure the breach force during obstacle reduction drive the task organization. However, when the size of the enemy force is known, force allocation is driven by the size of force required to assault the enemy position.

Reduce

Mobility assets are allocated to company teams to drive lanes through the obstacle to support an attack on an enemy position or the movement of follow-on forces. In general, the mobility assets available restrain a TF from providing breaching capability to all of its company teams. Therefore, priority of engineer force allocation goes to the company teams most likely to execute a breach. The engineers are under the command and control of the company team commander, move in their formation, and are included in the company team's actions on contact. This minimizes response time at the cost of massing breaching assets. The commander uses infantry and tank plows to provide breaching capability to units not task-organized with engineers. The commander uses available engineers to assist his infantry in preparing equipment and conducting breaching rehearsals during mission preparations.

When available, mobility assets are also maintained under TF control. This gives depth and flexibility to the in-stride force enabling the commander to shift engineer forces to where they are needed. This is particularly important when the formation is dispersed and obstacle locations are unknown. It also allows the commander to quickly mass engineer forces to transition to a deliberate breach.

TASK FORCE IN-STRIDE BREACH

The in-stride breach is the most common breaching tactic used at both brigade and TF level. A TF organizes for the in-stride breach when conducting passage of lines (forward or rearward), movements to contact, hasty attacks, movements through defiles, and when participating in an exploitation or pursuit. These missions are characterized by an unclear situation and usually drive the commander to organize for an in-stride breach.

Planning

Breach planning begins with IPB and engineer battlefield assessment (EBA) as part of the command and engineer estimate. The TF S2 and engineer jointly develop a situation template of the enemy disposition and most probable course of action (COA). The situation template is the focal point of force allocation and breach planning. If little is known about the situation, the S2 and the engineer identify areas where the enemy is likely to use obstacles or has used obstacles in recent activities. Likewise, the engineer and S3 request information from higher headquarters on recent friendly use of obstacles in the area of operations.

The commander and staff use this information to anticipate which units are most likely to encounter obstacles based on the scheme of maneuver. The commander task

organizes his subordinates with the combat power required to support and assault using the force ratios discussed in *Chapter 2*. The engineer recommends a task organization of engineer platoons and critical breaching equipment to create enough lanes for the breaching unit. The engineer maintains a mobility reserve under his control which is able to create additional lanes for follow-on forces. This mobility reserve is also used to mass mobility assets if transition to a deliberate breach is required. The TF FSO designs his fire plan to provide priority of fires and smoke to company teams likely to conduct a breach. The air defense officer (ADO) decentralizes the positioning of air defense weapons to provide local coverage of company teams during actions on contact and at obstacles. Above all, company teams are task organized for the mission first. The task organization is then modified where necessary to provide company teams with the additional forces needed to conduct independent breaching operations as part of the TF in-stride effort.

A force plans for an in-stride breach by appropriately task organizing subordinate TFs or company teams. The details necessary for success are developed by the subordinate commander. In a TF in-stride breach, the company team commander further task organizes his force and designates specific support, breach, and assault forces. Since conducting the breach only involves committing the combat power within the company team, the team commander incurs the responsibility to develop plans that synchronize the breaching effort and achieve the SOSR breaching fundamentals. Company team breach planning is deliberate, since it requires the team commander to develop a team scheme of maneuver or an immediate action drill that maneuvers support, breach, and assault forces (platoons) to apply SOSR breaching fundamentals on obstacle contact. If the enemy situation is unknown, support, breach, and assault forces execute their missions on order as part of an action-on-contact drill. However, these missions are part of the overall scheme of maneuver and are executed as a phase of the attack when the enemy and obstacle locations are known.

Preparing

Preparation for the in-stride breach fixes on subordinate TF or company team-level rehearsals. Since the success of a TF in-stride breach does not depend on the synergistic maneuver of company-sized support, breach, or assault forces, there is little need for a TF-level rehearsal. Instead, the success of the TF in-stride breach depends on the ability of company teams to quickly react to enemy and/or obstacle contact. The TF assists company teams in preparing for the mission by constructing and managing rehearsal sites that team commanders can use to drill their units on actions on contact and at obstacles. The TF engineer ensures that engineer platoons and breaching equipment link up with maneuver units early to maximize the opportunity to rehearse as a combined arms team. Company team commanders include their complete task organization in all orders, back briefs, rehearsals, and precombat inspections (PCIs). The TF minimizes the time spent on TF rehearsals and back briefs to allow company team commanders the time with their units. During TF rehearsals, discussion centers on how critical breaching assets will be shifted to support company team breaching operations and the transition to a deliberate breach.

Collecting Obstacle Intelligence

The ability of the force to collect timely and accurate intelligence both before and during the attack has tremendous impact on the success of the in-stride breach. A TF commander elects to breach in stride when the situation is vague or when intelligence indicates that enemy obstacles and fires can be overwhelmed by a company team. The breach will fail if the company team does not have sufficient combat power to suppress the enemy's fires or enough breaching equipment to reduce the obstacles. Therefore, confirming assumptions about the enemy and obstacles becomes critical to mission success. The size of the enemy force and the type of obstacle become priority information requirements for reconnaissance.

Engineer forces (usually a squad at TF level) are attached to the scouts to gather detailed intelligence on obstacle locations, composition, orientation, and so forth. Like any specialized collection asset, the engineer squad works for the scout platoon leader and is integrated into the total TF collection plan. The S2 and engineer provide the scout with specific NAIs for the engineer squad to reconnoiter; the squad sends its reports on the scout net.

OBSTINTEL collection is particularly difficult when the in-stride breach is used as part of a movement to contact. Again, engineers may be attached to the scouts. However, their ability to close with and gather detailed OBSTINTEL in time for the advance guard or main body to react is limited. Furthermore, organizing for an in-stride breach in a movement to contact quickly consumes the number of engineers available for the reconnaissance effort. The commander must weigh the impact that dedicating an engineer squad to reconnaissance has on his in-stride organization and ability to transition to a deliberate breach as well as on other engineer missions.

A force breaching in stride must continue to gather intelligence and develop the situation during the attack. Early detection of obstacles is essential in maintaining momentum and to the timely commitment of engineers. One technique is to assign the advance guard and lead units in the main body NAIs to watch for obstacles along the axis of advance. Company teams then assign a tank or BIFV section to scan these NAIs during movement, looking specifically for evidence of enemy or friendly obstacles.

Executing

Execution of the in-stride breach is completely up to the subordinate commander. For a TF in-stride breach, the company team commander applies the SOSR breaching fundamentals by synchronizing the efforts of his tanks, infantry, indirect fires, and engineer assets. When the in-stride breach is used because the situation is unclear, the company team commander achieves synchronization by executing well-rehearsed actions at obstacles. Platoons execute their support, breach, and assault missions as part of the scheme of maneuver when the company team's breach is, in turn, part of the TF plan of attack. In either case, it is a company team fight.

The TF commander has two roles in a TF in-stride breach which are crucial to company team breaching efforts. First, he ensures that the company teams receive the planned priority of indirect fires and smoke but still allows the company team commander to fight his battle. Second, the commander ensures that the additional combat power and mobility assets needed to transition to a deliberate breach are positioned for immediate response. The commander closely monitors the company team breaching effort so he can decisively commit his force to a deliberate breach, if necessary, with minimal cost in momentum.

ENGINEER INTEGRATION INTO THE FORCE

The in-stride breach is normally conducted by a TF or brigade during a movement to contact or hasty attack. The in-stride breach maintains the momentum of the attack by denying the enemy time to mass forces to cover the obstacles. Proper integration of engineers and breaching assets into TF and company team formations is critical to in-stride breach success. Because the exact location and nature of threat forces and obstacles are unknown, engineers and breaching assets must be distributed carefully to allow the commander to move securely while maintaining forward-deployed breach and assault forces.

A TF needs a minimum of two lanes separated by at least 100 meters to pass through an obstacle. This is the standard TF in-stride breach requirement. Constructing and marking each lane requires an engineer platoon reinforced with breaching equipment such as MICLICs and mine plows. A third platoon is required to provide depth and flexibility to the TF mobility effort. A main effort TF, therefore, integrates an engineer company throughout its maneuver formations when breaching in stride. Supporting a TF in-stride breach with fewer engineers decreases the probability of success.

Figures 3-1 through 3-6, pages 3-4 through 3-6, show engineers integrated into a TF column, V-, echelon right, box, wedge, and line formations. Engineer integration into TF formations must provide lead company teams with immediate breaching capability and maintain the flexibility to shift assets to where they are needed. Engineer platoons reinforced with special breaching assets from the engineer company are integrated directly into the combat formations of the lead company teams. An engineer platoon is usually maintained under TF control as a mobility reserve. This platoon maneuvers the center of the TF formation or echelon off the company team most likely to need engineer support. Additional specialized breaching assets from the engineer company also travel to the center of the TF under centralized control. The engineer commander moves with the TF, positioning himself where he can best control assets under his control and track the efforts of his detached platoons.

The tactical situation often requires a TF to modify its combat formation. Maneuver units train constantly to accomplish this quickly and efficiently; field SOPs outline required actions in great detail. Engineers integrating into the formation must adjust rapidly to maintain engineer and breaching assets with lead companies. Transition from a V-formation to a column formation and vice versa is not complicated; engineers remain integrated in lead company team formations. Transitioning from a wedge to a column, however, can be more difficult. Ideally, transition to a column formation should end up with engineers supporting the first two company teams in the column.

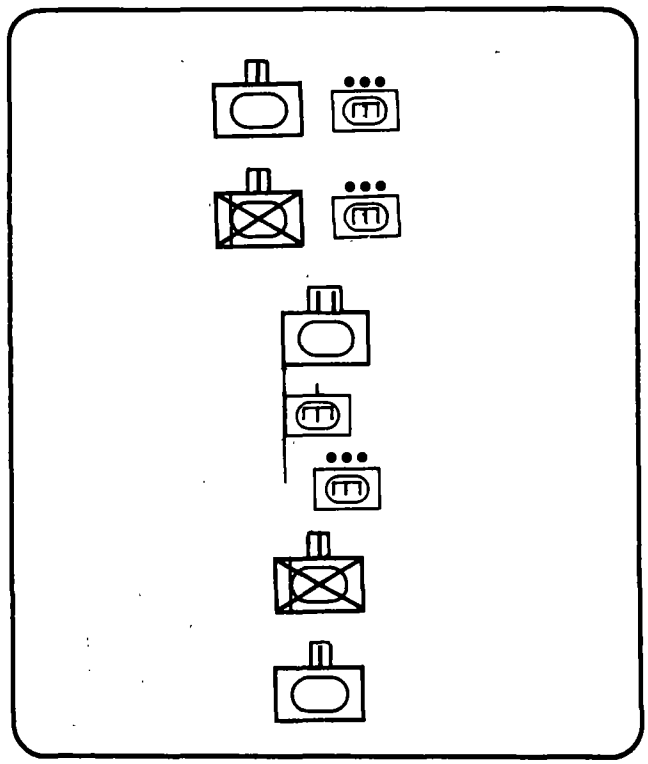


Figure 3-1. Integration of engineers into a task force column formation.

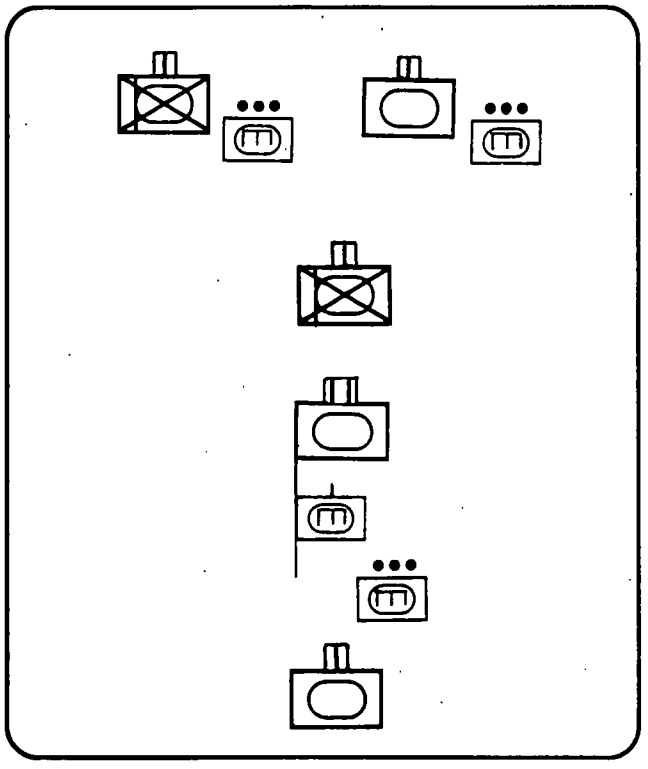


Figure 3-2. Integration of engineers into a task force V-formation.

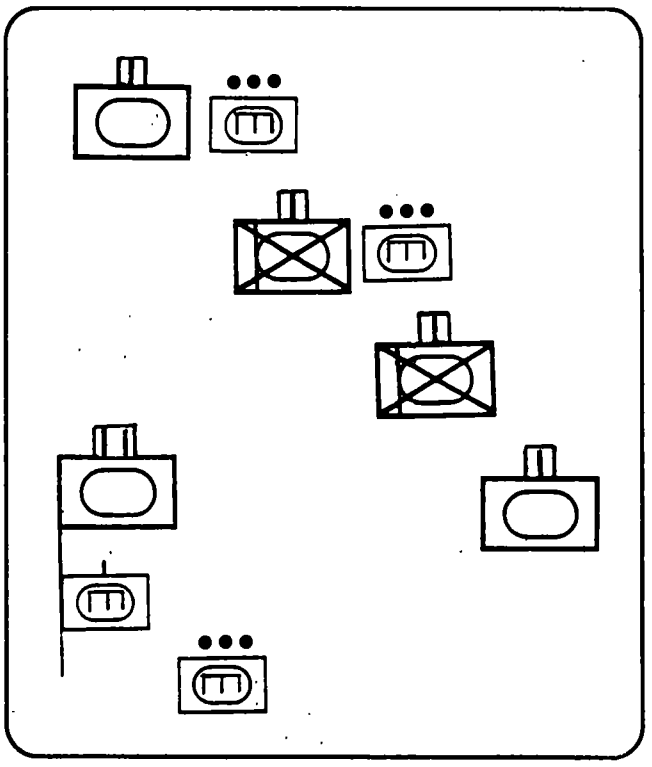


Figure 3-3. Integration of engineers into a task force echelon right formation.

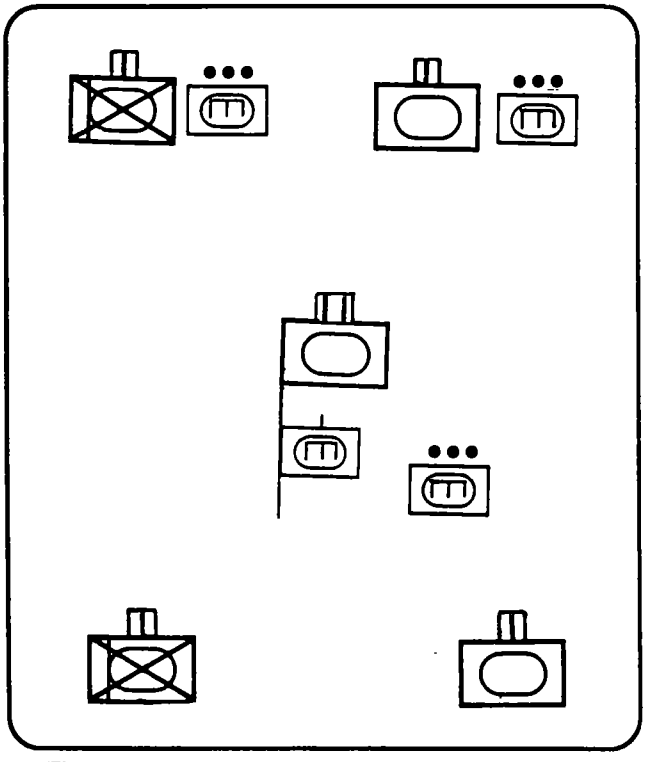


Figure 3-4. Integration of engineers into a task force box formation.

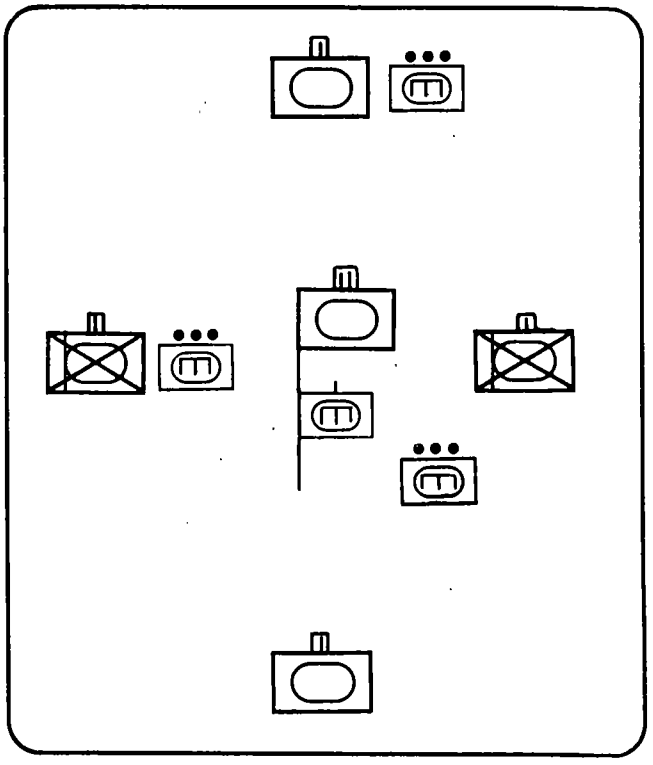


Figure 3-5. Integration of engineers into a task force wedge formation.

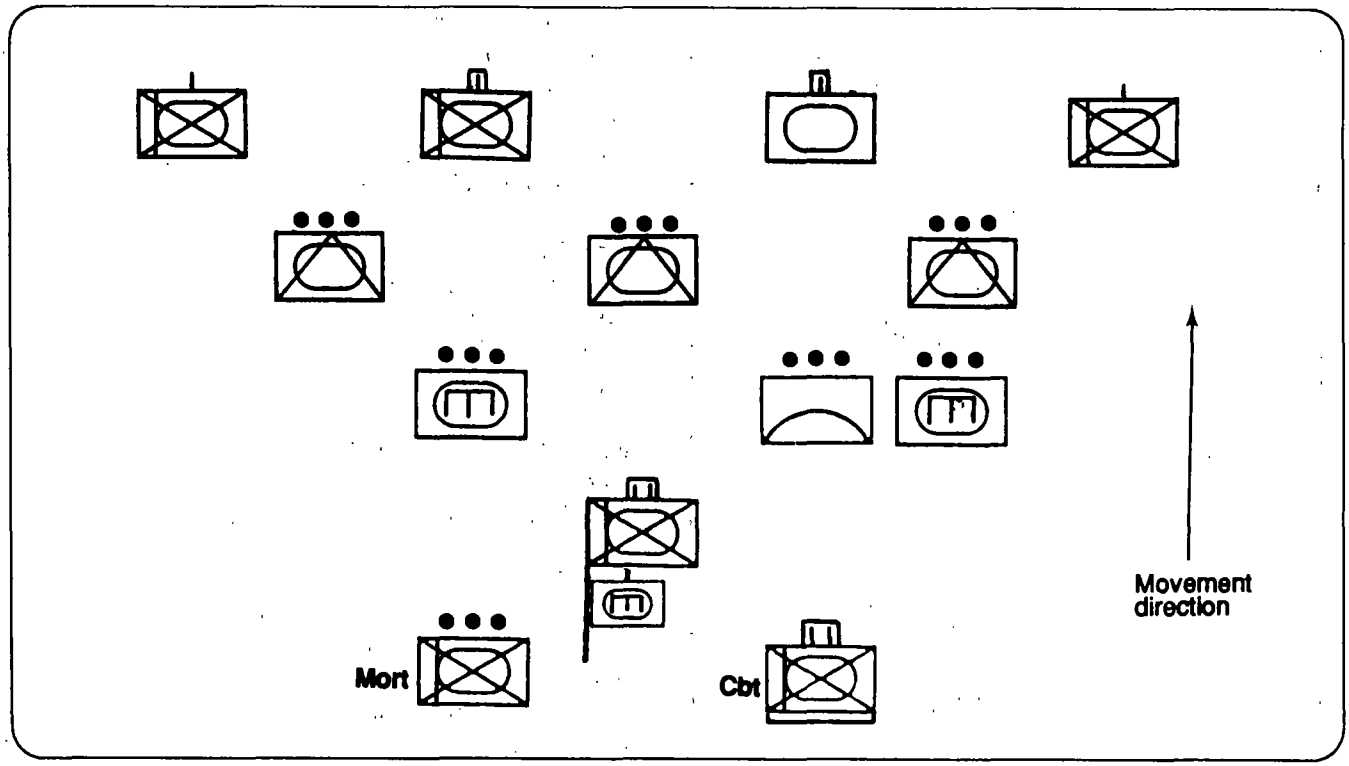


Figure 3-6. Integration of engineers into a task force line formation.

Regardless of which formation the TF uses, the TF combat trains usually travel just in front of or just behind the trail company. Critical engineer Class V materials, such as an emergency resupply of demolitions and MICLIC reloads, are transported in the combat trains. Breaching equipment such as unmounted mine roller sets are also carried in the combat trains. The commander, engineer, and supply officer (S4) (US Army) anticipate when these assets might be used and develop a plan for rapidly moving them forward.

Integrating engineers into the force continues at the company team level. The company team commander determines which combat formation is appropriate for each phase of the attack. Much of the engineer equipment (armored vehicle-launched bridges (AVLBs), combat engineer vehicles (CEVs), and vehicles towing MICLICs) cannot maintain the same rate of advance as tank and mechanized infantry platoons equipped with M1s and M2s. Therefore, the engineer platoon leader must fully understand the company team scheme of maneuver and which formations will be used and anticipate changes in formation. Close coordination between the engineer and maneuver company team commander is vital to ensure support is at the right place at the right time.

An engineer platoon normally maneuvers with four M113s and a CEV. The carriers do not tow trailers, except for MICLIC launchers. AVLBs and armored combat earthmovers (ACEs) augmenting the platoon move behind the company team. They remain one terrain feature back, guiding on the trail element, and are always within support range. A good technique is to maneuver AVLBs and ACEs with the company trains. They move under the control of the engineer platoon leader. *Figure 3-7* illustrates a lead company team maneuvering as part of a TF in-stride breach in an echelon left formation. *Figure 3-8, page 3-8,* depicts the breaching capabilities represented within this formation.

TASK FORCE IN-STRIDE BREACH SCENARIO

The TF mission is to attack to secure a terrain-oriented objective (OBJ Red) and prepare a hasty defense to destroy the enemy forward security element (FSE) and advance guard main body of an attacking motorized rifle regiment (MRR). The brigade main effort will attack along Axis Strike to destroy the MRR main body. The S2 and engineer know the terrain west of OBJ Red was recently used in an enemy defense. Intelligence sources indicate that there is no organized combat force left defending the area, although groups of one or two armored vehicles have been observed. The location and composition of obstacles remaining in the area are unknown. However, the S2 has a general idea of where the enemy established its defensive positions. The engineer and S2 template how they believe the enemy defense was arrayed. *Figure 3-9, page 3-9,* shows the situation template and brigade maneuver graphics the commander used for planning.

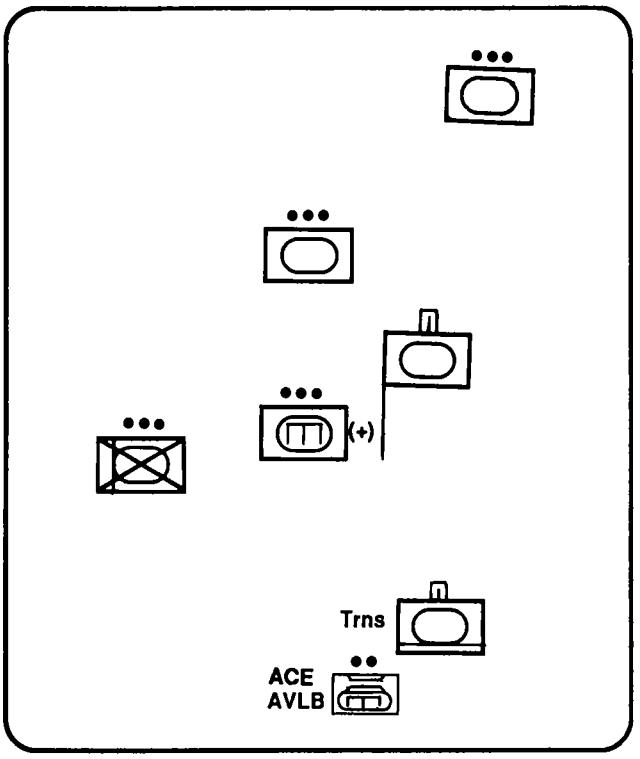


Figure 3-7. Integration of engineers into a company team echelon left formation.

The TF commander is faced with an unclear situation and considers rapid movement along Axis Flash critical to securing OBJ Red in time to establish a hasty defense. The TF commander chooses a COA that organizes his force for a movement to contact on Axis Flash. Scouts reconnoiter along Axis Flash as the security force and provide one section to guard the TF southern flank orienting on CP 9. Team A is the TF advance guard and leads Axis Flash. The TF main body moves in a V-formation with Company B leading on the left, Team C leading on the right, and Company D trailing Company B (see *Figure 3-10, page 3-10*). Team A secures OBJ Red occupying battle position (BP) A1. The TF main body moves through OBJ Red and establishes a hasty defense oriented into engagement area (EA) Tiger. Company B, Team C, and Company D occupy BPs B1, C1, and D1 respectively. The scout platoon (minus) establishes mounted operations forward of EA Tiger to identify the enemy's main effort.

The unclear obstacle situation, the need to maintain TF momentum, and the likelihood that company teams will have to conduct independent breaching operations drive the engineer to recommend organizing the TF for an in-stride breach. The engineer considers the type of obstacles he is likely to encounter and the assets he has available in task organizing mobility assets.

The scheme of engineer operations is to provide redundant and diverse breaching capability to the advance guard and lead company teams of the main body. A mobility reserve is maintained under TF control that is able to shift where it is needed if heavy contact is made and transition to a deliberate breach becomes necessary. The priority of engineer effort is to support the advance guard with the mobility it needs to develop the situation. The lead teams in the TF main body, Company B and Team C, are each supported with mobility assets based on their organic weaknesses. Company B (tank-pure) receives an engineer platoon (plus) to give it a dismounted breaching capability. Team C (mechanized heavy) is task organized with two plows and a roller from Company B to give the team mechanical breaching capability. The engineer company (minus) maneuvers in an echelon position left of Team C. From there it can shift its remaining engineer platoon to support Team C or Company D should the need arise. The engineer company keeps two AVLBs, two ACEs and a CEV forward under its control (see *Figure 3-10, page 3-10*).

The engineer recommends using PL Levis to indicate where company teams are likely to encounter obstacles and to trigger company team commanders to deploy available rollers. He further recommends that Team A and Company B focus observation on CP 11 while Team C observes CP 10 during movement for probable locations of obstacle (see *Figure 3-11, page 3-10*).

The TF commander ensures that other combat multipliers are positioned to support company team breaching efforts. Priority of artillery and mortar fires is given to Team A as the advance guard. Priority of mortar fires shifts to Company B once Team A is at PL Bandit. The mortars will operate in split section to provide continuous coverage. Initially, the entire mortar platoon moves with Team A. One section drops off at PL Levis and occupies CP 8 to provide immediate suppression and smoke as the advance guard moves to PL Bandit. The other mortar section continues with Team A and occupies BP D1 to provide support while the trailing section picks up and moves with the main body. Air defense assets move with company teams under armor to provide local coverage during company team breaching operations.

The TF execution matrix is shown at *Figure 3-12, page 3-11*. The plan is to transition to a deliberate breach by giving company teams in the main body prepared support and assault missions. The mobility reserve mission is to move Team C, which now becomes the breach force (see PL Redman - PL Bandit of execution matrix). Company B establishes an ABF position and controls indirect fires. Company D becomes the TF assault force.

An excerpt from the Team A commander's execution matrix and an immediate action drill sketch used during his operation order (OPORD) are shown at *Figure 3-13, page 3-12*. These illustrate how the Team A commander has developed an immediate action drill to support the

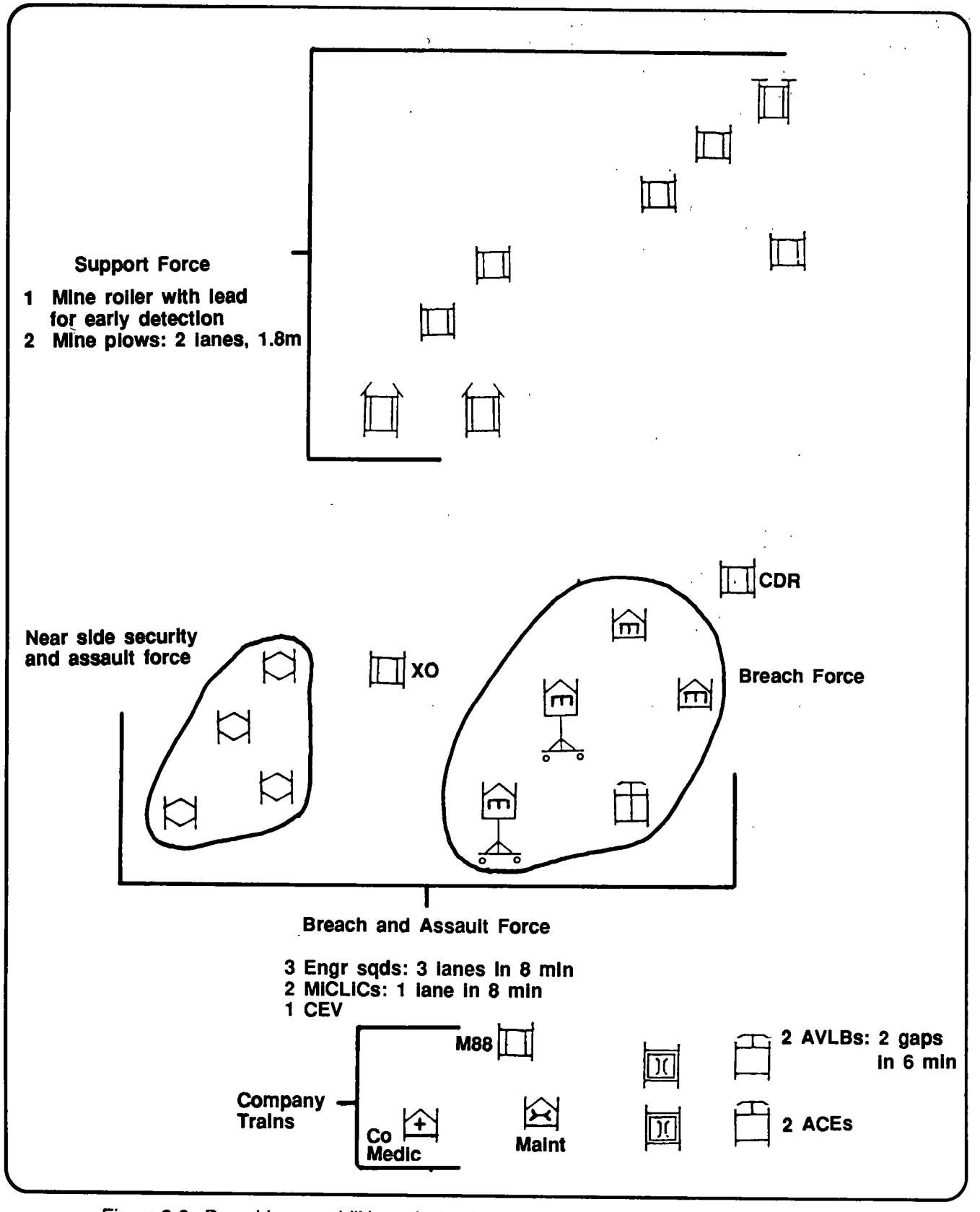


Figure 3-8. Breaching capabilities of a lead company team in a task force in-stride breach.

TF in-stride breach. First and second platoons are the designated support force. The mechanized infantry and engineer platoons form a breach and assault force and maneuver together. The infantry provide local security for the engineers during obstacle reduction, if necessary, and assault through the lanes to conduct a hasty attack. If there is no contact, the infantry continues to overwatch and assist in passing the tank platoons through the lanes. The tanks lead through the lanes and the team resumes its formation.

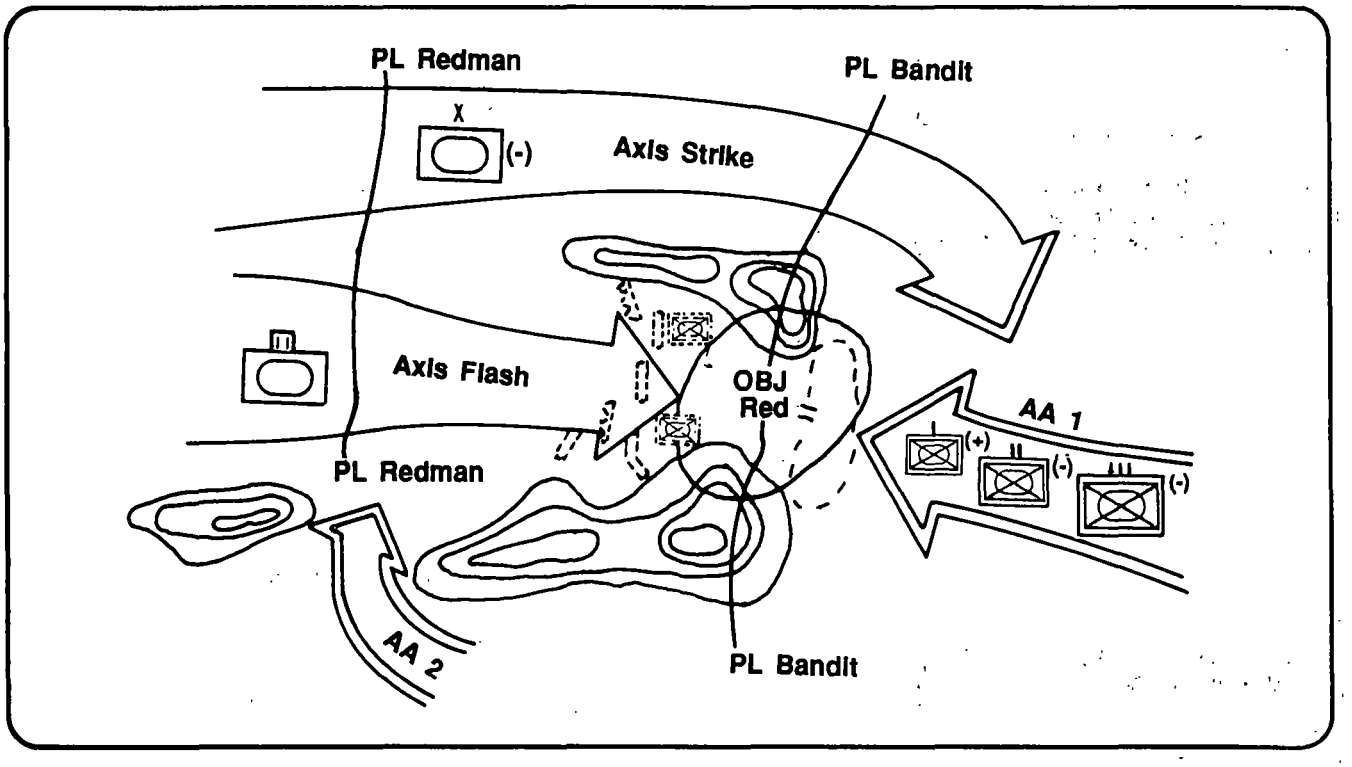


Figure 3-9. Brigade graphics and situation template.

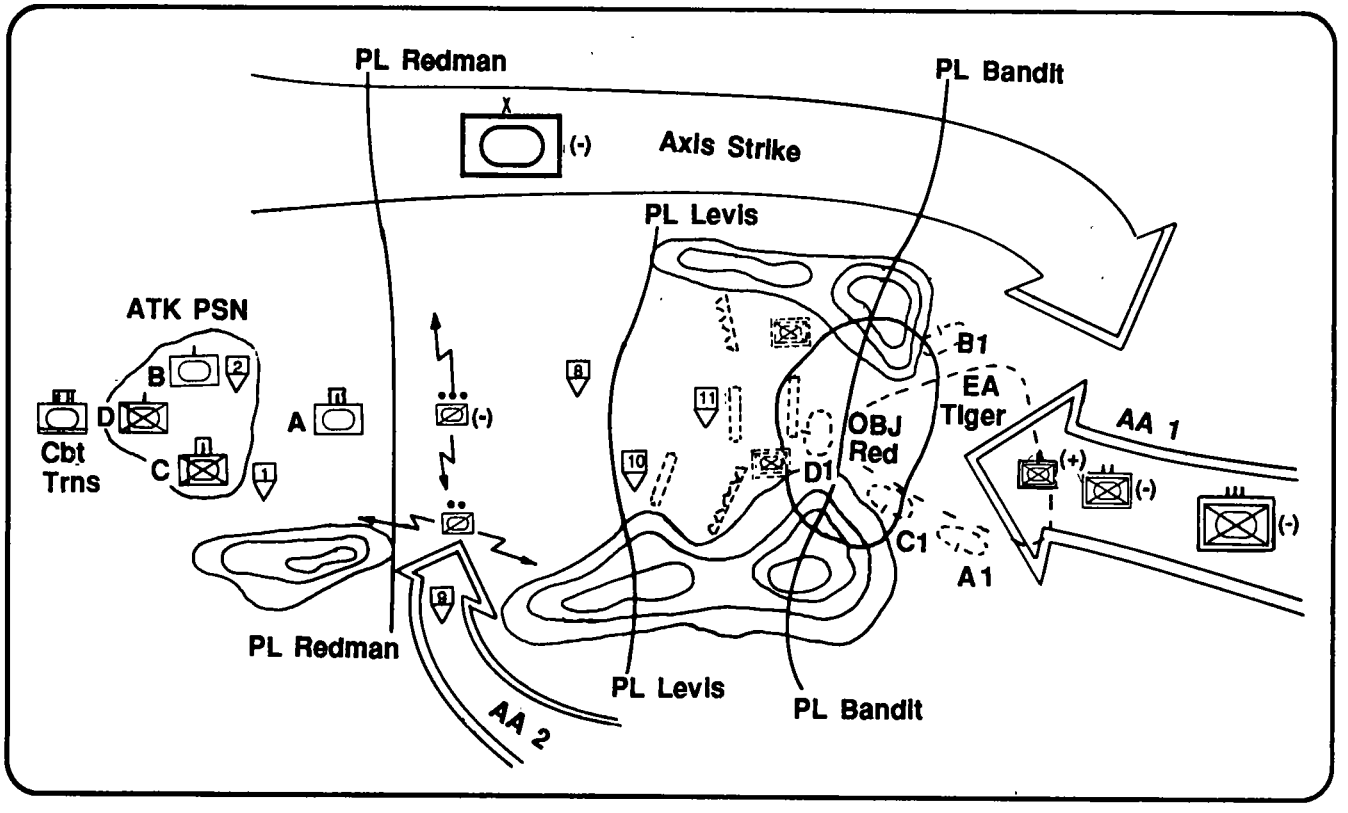


Figure 3-10. Task force for maneuver graphics and situation template.

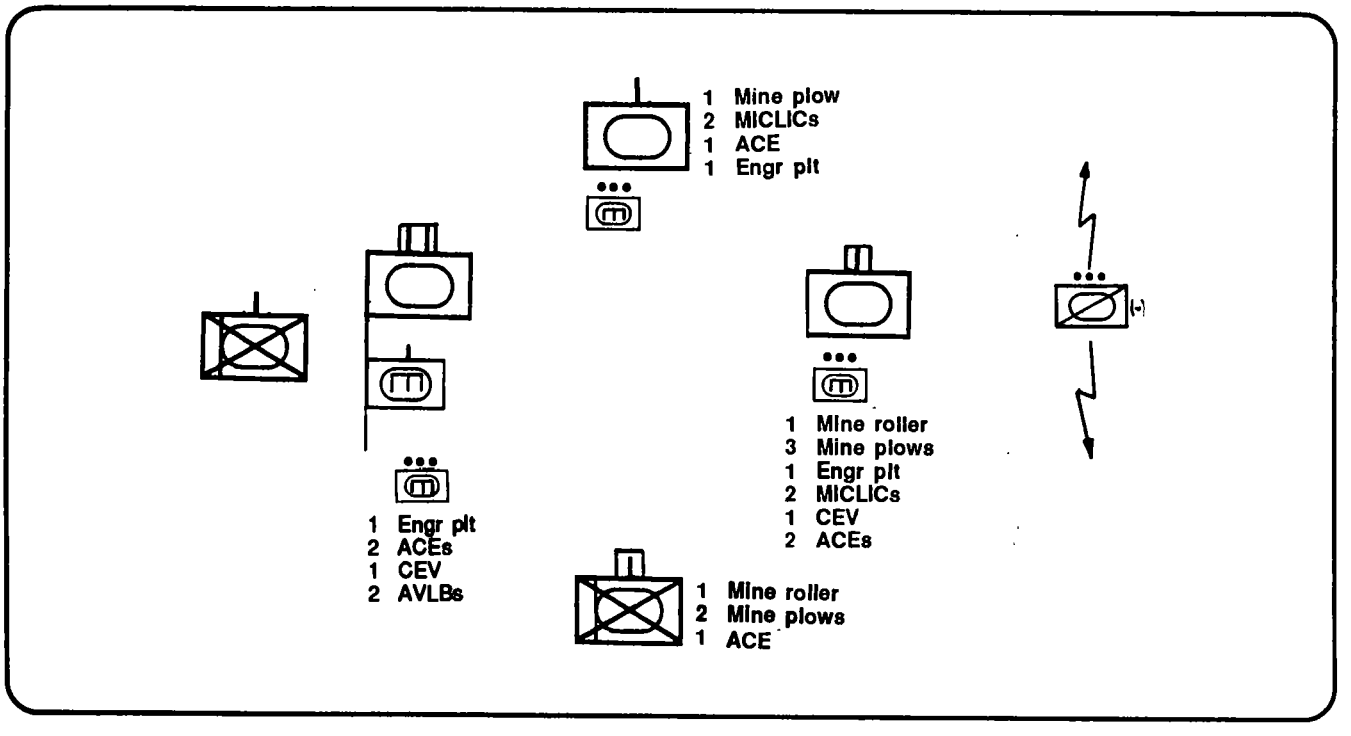


Figure 3-11. Mobility force allocation.

	Team A	Company B	Team C	Company D	Engineer (-)	Scouts	Mortars
Units	3/C 1/EN	3/EN	3/A		3/EN 2 AVLB 2 ACE 1 CEV	SEC 1 SEC 2 SEC 3	SEC 1 MORT SEC 2 MORT
Attack Position	Move to PL Redman	OCC CP 1 / Orient north-east	OCC CP 2 / Orient south-east	Echelon left of Team C	Center between B & C	Screen PL Redman / Guard CP 6	Move with Team A
PL Redman to Levis	Orient CP 8 & 11 / Report PL Levis	O/O lead left TF(-) in a V / Orient CP 8	O/O lead right TF(-) in a V / Orient CP 10	Trail TF(-) in a V / Follow engineers	Echelon left of Team C	PL Bandit CP 10 & 11 / SEC 1 guard CP 9	Move with Team A
PL Levis to OBJ Red	Secure OBJ Red Orient D1 / Report OBJ Red secure	Orient CP 11 / B/P TF Support Force	Orient D1 / B/P TF Breach Force	Trail TF(-) / B/P TF Assault Force	Echelon left of Team C / B/P SPT Team C & D	OCC A1 / Collapse guard at CP 9	SEC 1 OCC CP 8 / SEC 2 move with Team A
OBJ Red Secure	OCC A1 / EA Tiger	Move thru OBJ Red / OCC B1	D1 O/W CO B / O/O follow CO B OCC C1	Trail Team C / O/O OCC D1	Improve lanes Assist passage of Combat Trains	Screen east EA Tiger / Orient AA1	SEC 1 move behind CO D / SEC 2 OCC D1
Hasty Defense EA Tiger	A1 / EA Tiger	B1 / EA Tiger	C1 / EA Tiger	D1 / EA Tiger	Consolidate all engineer D1 / Emplace MF EA Tiger	Establish OP s 1, 3, & 4	SEC 1 & 2 OCC D1
Consolidate	A1 / EA Tiger	B1 / EA Tiger	C1 / EA Tiger	D1 / EA Tiger	Begin clearing operations PL Levis to PL Bandit		

Figure 3-12. Task force execution matrix.

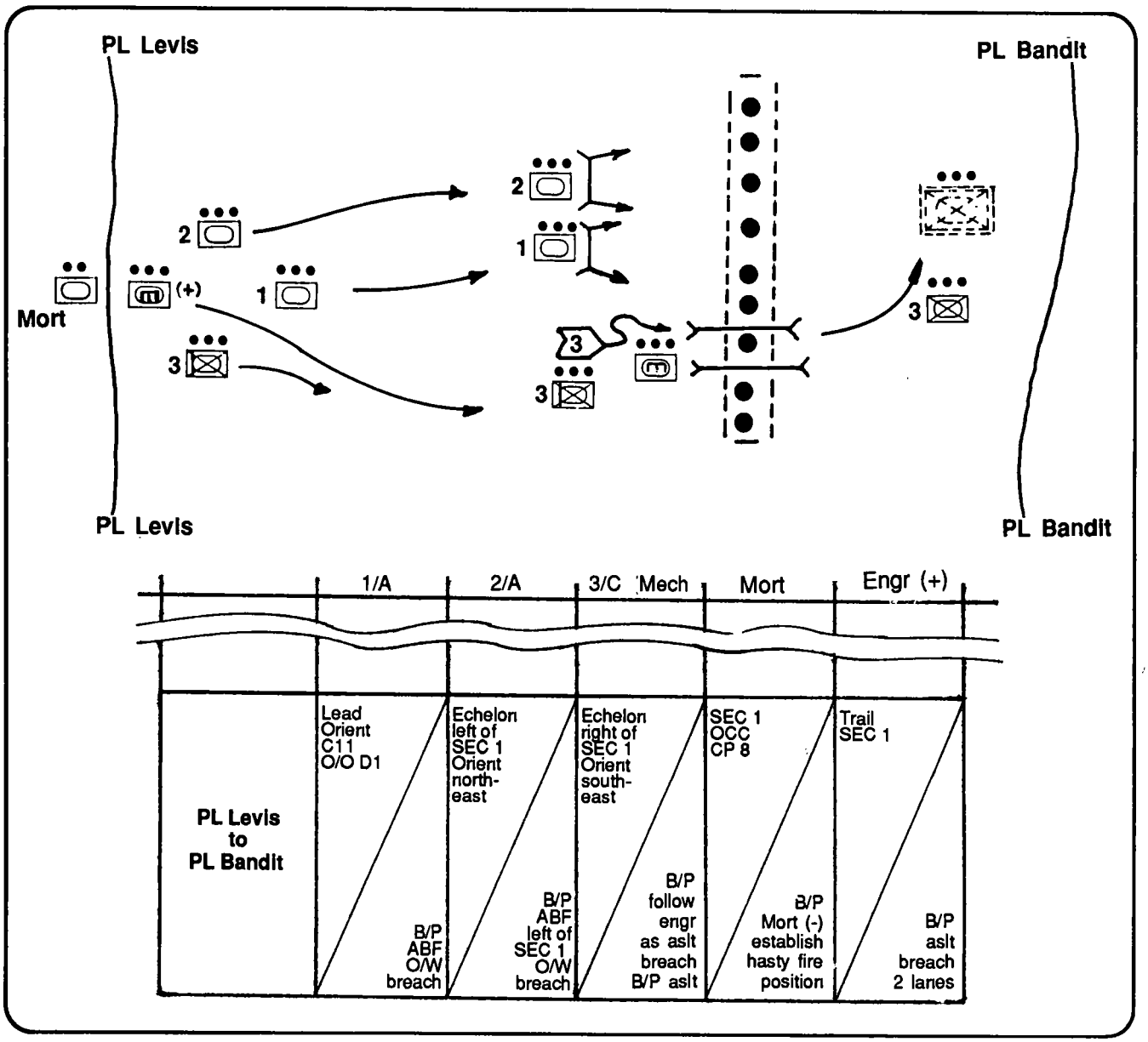


Figure 3-13. Team A's immediate action at obstacles drill and matrix extract.

Chapter 4
Deliberate Breach

The deliberate breach is a scheme of maneuver specifically designed to cross an obstacle in order to continue the mission. A unit conducts a deliberate breach when the force allocation ratios for support, breach, and assault forces are beyond the capability of a task-organized subordinate unit. The deliberate breach is characterized by thorough reconnaissance, detailed planning, extensive preparation, and explicit rehearsal. One or more subordinate units are specifically tasked to perform the role of support, breach, and assault forces. The deliberate breach is centrally planned and executed.

Units will conduct a deliberate breaching operation when the—

- Unit fails an attempted in-stride breach of enemy tactical obstacles.
- Force allocation ratios indicate that a confirmed enemy situation is beyond the capabilities of a subordinate unit.

A deliberate breach requires detailed reconnaissance, exhaustive combined arms rehearsals, and overwhelming suppression of the enemy's overwatching direct-fire weapons before the initiation of obstacle reduction. The breaching tenet of mass drives task organization for the deliberate breach. For example, the breach force has the bulk of mobility assets and is tailored to counter a specific type of obstacle. Direct and indirect fire systems are massed in the support force in order to provide the necessary suppression. Forces required are massed into the assault forces to seize the initial foothold into the objective. The synchronization breaching tenet applies to the force's scheme of maneuver, which must meticulously address subordinates' actions at the obstacle and concentrate on achieving synergism in support, breach, and assault forces.

Maneuver company teams, TFs, and brigades can conduct deliberate breaching operations. Normally, a company team executes a deliberate breach because the commander must halt the unit's momentum to maneuver his platoons as support, breach, and assault forces. A TF may execute a deliberate breach as part of a brigade in-stride breaching operation, with the company teams being maneuvered as the breaching organization forces. The brigade is the highest level that conducts a deliberate breaching operation.

DELIBERATE BREACHING FUNDAMENTALS

Unlike the in-stride breaching operation, the support, breach, and assault forces for a deliberate breaching operation are given specific objectives and detailed control measures for the attack against the obstacle system. The force does not have to disperse the support, breach, and assault functions between two or three units to compensate for a lack of detailed obstacle information during movement. *Figure 4-1, page 4-2*, shows an extract of a deliberate attack order and execution matrix for TF Mech. The TF Mech commander has task organized specifically for the deliberate breach and attack.

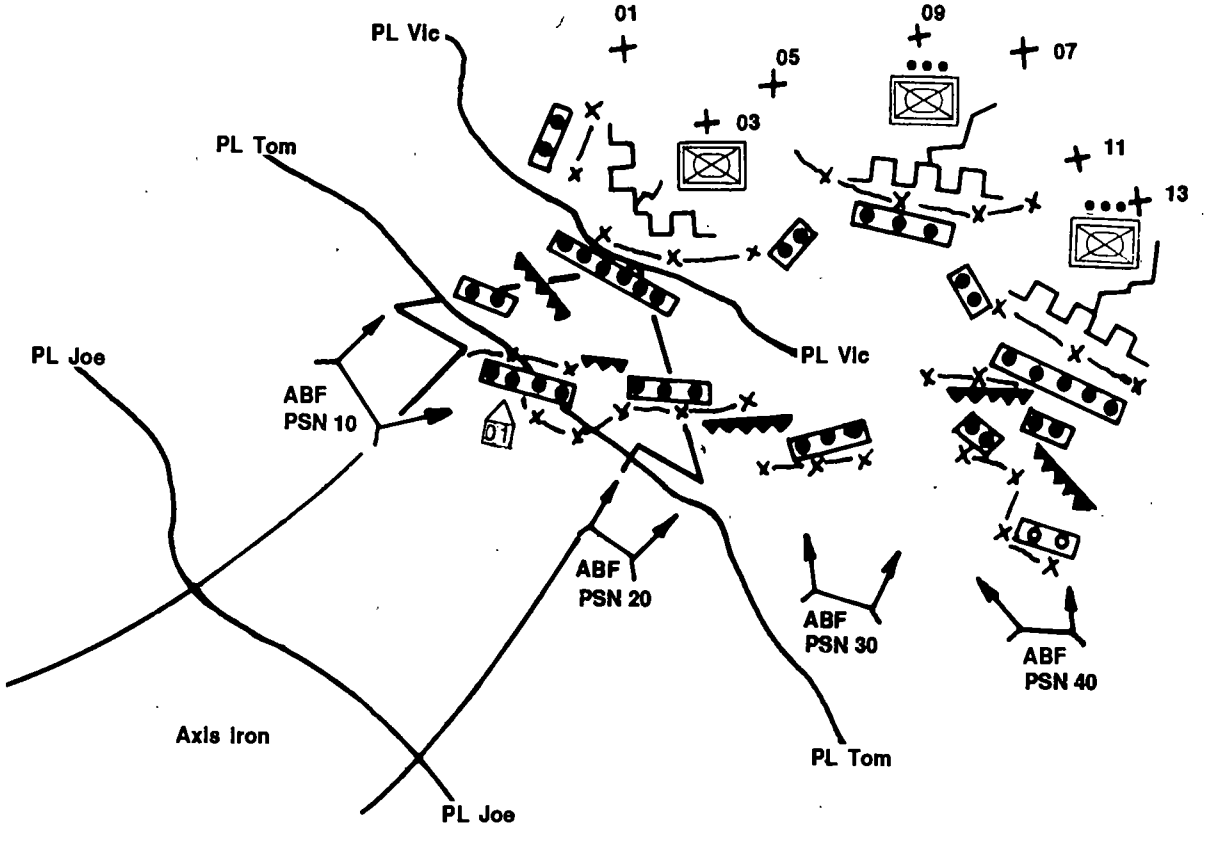
Suppress

Deliberate breaching operations will usually require relatively more firepower than in-stride breaching, since the enemy is generally stronger and in better-prepared defensive positions. Normally, two company teams are the minimum support element for a TF attacking an enemy company position. If the enemy has one or more platoons that cannot fire on the breaching location without shifting to supplemental positions, it may be fixed with a single company's fires. This will allow an even higher firepower ratio against the platoon being directly attacked. The TF commander should deploy the support force in a position to fire simultaneously on the defenders from several directions.

Often, the most effective way to suppress the enemy is to conduct an assault against the overwatching defenders before or during obstacle reduction. If the assault successfully eliminates the position, it also eliminates direct fires on the breaching element. If the assault does not succeed in securing the position, it still fixes the enemy and reduces the enemy's ability to place fires on the breaching element. Direct and indirect fire suppression from the support force is necessary to support this assault.

Suppression must also be effective against the enemy's indirect fires. Enemy indirect fires are extremely dangerous during the deliberate breach, since the breach force will be exposed for a lengthy period. Friendly artillery and air assets support the deliberate breach by attacking all enemy artillery positions capable of firing on the breaching location. The attacker jams enemy fire-control nets. The FSO designates deliberate breaching sites as critical friendly zones for the target acquisition battery so that they are treated as priority targets for counterbattery support.

The deliberate breach uses a larger support force than the in-stride breach to provide overwhelming suppression. In the extract execution matrix, the TF Mech plans to establish suppression with Teams A, B, and D, and Company E along



	Team A	Team B	Team C	Team D	Team Engineer	Company E
Units	1/A 2/A 3/B 1/C	1/B 2/B 3/A	1/C 2/C 3/D CEV		2/C 3/C	1/E 2/E 3E(-)
PL Tom to PL Joe	OCC ABF 30 Orient 11-05	OCC ABF 20 Orient 03-07	OCC CP X O/O Assault	OCC ABF 40 Orient 13-09	O/O breach vicinity CP 10 B/P pass Team C	OCC ABF 10 Orient 01-03

Figure 4-1. Task force maneuver graphics and execution matrix extract.

with supporting 155-millimeter artillery and 4.2-inch mortars.

Normally, suppression begins with artillery fires on the defender. This assists the support force to move in its ABF position.

Obscure

Obscuration serves the same purpose for the deliberate breach as it does for the in-stride breach. It reduces the effectiveness of direct and indirect fires against the breach and assault elements and also helps isolate the area selected for the breach.

Terrain features that mask the movement of the force to the site and limit the number of defenders that can effectively observe and fire on the breach force aid in obscuration. Other natural, limited-visibility conditions (such as darkness or fog) should be exploited if possible. Smoke is generally the primary obscurant. However, it is a double-edged sword; it may attract enemy attention as well as degrade friendly target acquisition and command and control.

The deliberate breaching operation may require large quantities of carefully employed artificial obscuration to screen breach and assault forces and to obscure enemy fires. This is particularly important for complex breaching problems where the breach force is exposed for an extended time. Smoke, then, is important in deceiving the enemy as to the breaching location and interfering with his fires. If smoke platoons are available, they provide the bulk of the smoke.

Smoke requirements are determined by using *FM 3-50*. Blanket, haze, or curtain-screening smoke degrades enemy observation of assault and breach force operations. A smoke platoon is capable of providing support for a 1- to 3-kilometer front. A large breaching operation requires a chemical company to provide smoke support for a 2- to 7-kilometer front. The force uses a combination of carefully placed smoke pots and indirect fires to augment smoke support. Howitzers and mortars supporting the force can build and maintain smoke, but smoke effectiveness depends on the number and rate of smoke rounds delivered. Using indirect-fire support to provide smoke competes with the force's HE and dual-purpose improved conventional munition (DPICM) missions against the enemy. The commander must decide the priority for the use of indirect assets, and his decision must be clear to subordinates. Vehicles equipped with engine-exhaust smoke systems and smoke-grenade launchers can provide local smoke during reduction and passage of the assault force. However, these systems are self-defense mechanisms, and the force must not rely on them to supply all obscuration for a deliberate breaching operation.

Friendly forces must rehearse breaching operations under conditions similar to those expected. Training with smoke support is important, since smoke can obscure friendly observation and target acquisition and degrade command and control.

Secure

Securing the breaching site during a deliberate breaching operation is more complex than for an in-stride breach. The defending position will be stronger, there may be more and stronger outposts near the obstacle, reduction will take longer, and there is a strong possibility that a counterattack will interfere with the breach force. Because of this, the commander may launch a dismounted assault against the defender before the obstacle is reduced for mounted forces. The assault force can then establish blocking positions to defeat counterattacking forces. The breach force provides local security for lane-reduction operations and forces passing through the lanes.

The breach force employs SOSR breaching fundamentals locally while reducing the obstacles. It is normally an engineer company team with attached armor and infantry platoons. The breach force secures the obstacle breaching site by physical occupation and positions forces to defeat local counterattacks. It employs suppressive fires against defenders that are still capable of firing on the reduction effort and uses local smoke pots and vehicle smoke generators to add to obscuration.

The maneuver component of the breach force must be large enough to defeat local enemy counterattack forces. For example, a defending Soviet battalion counterattack force will be approximately the size of a platoon. Each lane must be integrated into a breach force fire-and-maneuver scheme that is capable of defeating a platoon-sized hasty attack.

The force also templates the enemy's capability to move and attack with regimental counterattack forces (see *Figure 4-2, page 4-4*). The critical element in this template is the time in which the counterattack can occur. The commander must estimate the time required to complete the breach and ensure that his forces are deployed in time to defeat the enemy's counterattack. Detailed and repeated rehearsals produce the most accurate estimates.

The best method to provide security from counterattacks during lengthy deliberate breaching of a complex obstacle is to assault and capture the enemy positions covering the breaching site and to establish hasty defensive positions to secure the force. This method denies direct fires and observation to the breaching site that would otherwise be available. The commander may position additional forces on the shoulders and flanks of the breaching area to protect against counterattack.

The commander can also use long-range artillery fires, air interdiction, attack helicopters, and SM systems to impede enemy counterattack forces at vulnerable choke points. These locations are plotted before the operation during detailed fire support and obstacle planning. Specific assets

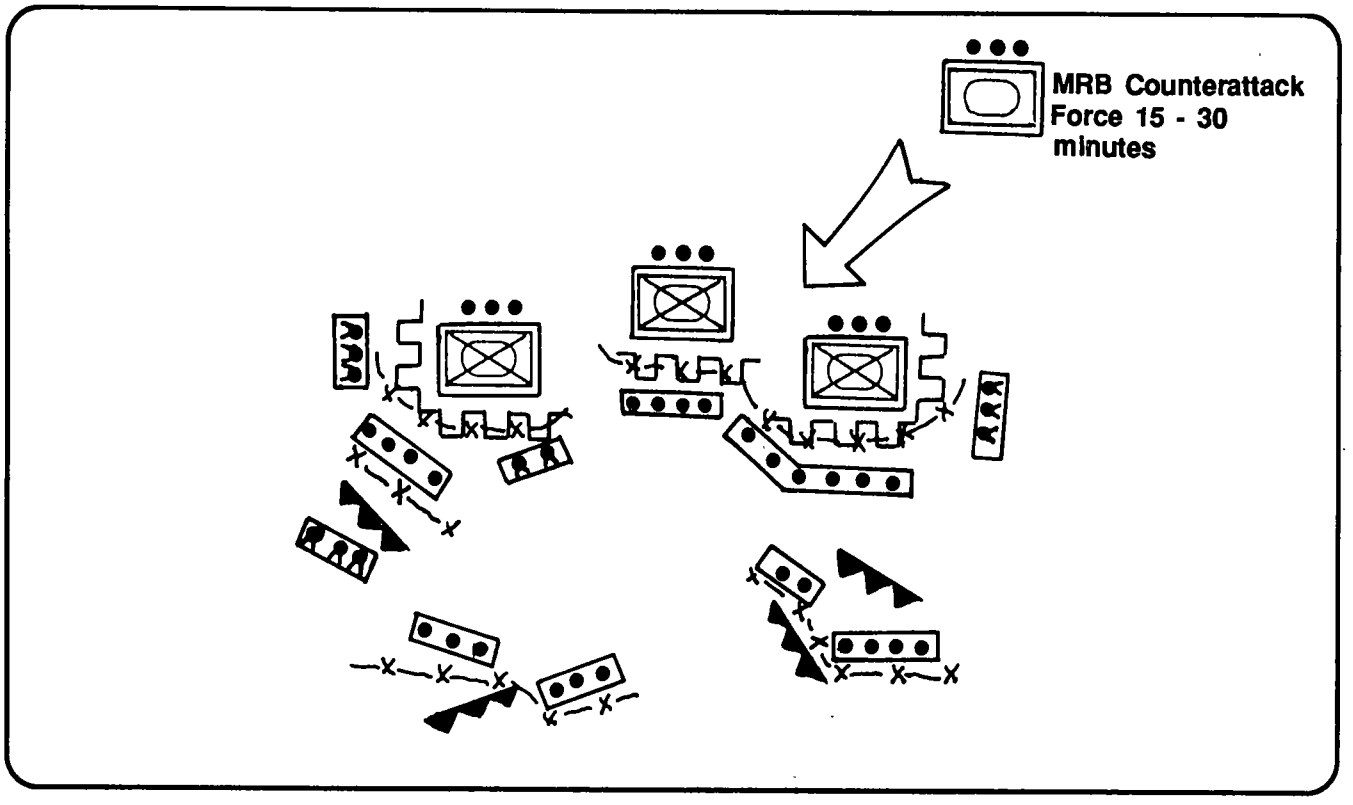


Figure 4-2. Enemy situation template.

and units such as GSRs and patrols are tasked to verify the route a counterattack force is traveling. This allows the effective use of scarce fire support and SM systems to disrupt or fix the enemy counterattack.

Reduce

Reduction of the obstacle in a deliberate breach is normally a mission of an engineer-heavy breach force. It masses reduction efforts, attempting a large number of lanes simultaneously to overload defensive fires while employing SOSR breaching fundamentals to reduce the effectiveness of enemy fires. The breach force also uses a variety of reduction techniques to guarantee success, regardless of obstacle countermeasures.

The number of lanes the breach force prepares is determined by METT-T analysis. More lanes are better to allow the force to pass quickly through the danger area. A TF requires at least two lanes. For a brigade, the number of lanes depends on the size and role of the assault force and whether the portion of the brigade passing the obstacle is in attack formation or in modified column. Depending on available time, reduction efforts may be restricted to two or three lanes, which forces a more concentrated, higher-risk passage. Lanes must be separated by at least 100 meters.

An engineer platoon is necessary to produce each lane. The commander allocates enough engineers and breaching assets to the breach force to provide this level of effort and sufficient redundancy to handle unforeseen circumstances. Engineers deploy in a formation configured to breach specific obstacles. The Threat doctrinally prepares obstacles for the deliberate defense with buried mines and antihandling devices. Engineers reducing such obstacles may have to use slow, manual-reduction techniques and breach through multiple types of obstacles.

In the deliberate breach, the breach force engineer teams will clear, mark, and remain with the obstacle lanes until the entire force has passed. Then the engineers hand the lanes over to advance elements of follow-on units and rejoin their own units.

The assault force also requires engineer support for assault breaching through protective obstacles and fortifications within the defensive position.

TASK FORCE DELIBERATE BREACH

The TF deliberate breach is used as a vehicle for discussing the detailed planning, preparation, and execution necessary in a deliberate breaching operation. The principles outlined below apply equally to brigades and company teams.

Planning

Planning a deliberate breaching operation begins with the command and engineer estimates. The TF S2 templates the

enemy's order of battle (OB), and the engineer assesses its engineer capabilities. Both the engineer and S2 doctrinally template the enemy's tactical and protective obstacles. The staff develops COAs using the templates. The engineer develops his scheme of engineer operations for each COA and recommends whether an in-stride or deliberate breaching operation is necessary. After a COA is selected, the commander must carefully allocate available assets to the breach, assault, and support forces to ensure that they can accomplish their assigned tasks. The commander uses the recommended force allocation ratios and task organizes his friendly forces. The decision to conduct a deliberate breach is the result of the force allocation, involving the estimates and scheme of maneuver. Since there will seldom be enough breaching assets available, commanders must ensure that their main effort is more heavily weighted.

Identifying the enemy's vulnerability is important so that the force can mass direct and indirect fires and maneuver against that weakness. A portion of the enemy is isolated to achieve the desired combat ratio at the point of assault. Achieving mass is accomplished by hitting the enemy from multiple directions and by narrowing attack zones to concentrate the attacker's force against a smaller defending element.

When the attack requires breaching two or more complex obstacle systems, the commander must retain enough engineers and breaching assets to reduce subsequent obstacles. The commander must not commit all the engineers to breach the first obstacle system unless he is willing to risk his capability to breach follow-on obstacles. Depleted engineer forces need significantly more time to conduct follow-on breaches.

The commander maneuvers his combat power to create sufficient suppression and security for the breach to be successful. Adequate suppression and security triggers the commitment of assault and breach forces. When the breaching site is free of direct fires, the commander deploys the breach force to create lanes through the obstacle. The commander must sense the progress of the breach so he can decisively commit the balance of the force through the obstacle to continue the mission.

The breach and assault forces may require fires and smoke under their control in addition to that controlled by the support force. The support, breach, and assault forces place direct fires on enemy positions. This makes synchronization of direct and indirect fires extremely complex and requires the personal attention of the TF commander. Fire control must be planned in detail using simple and well-understood control measures and then rehearsed with careful supervision.

When a brigade conducts a deliberate breach or when a passage of lines of a large force is planned after a breach, breach plans must include detailed planning for the staging and movement of follow-on forces and equipment.

Preparing

The TF continues an aggressive intelligence-collection plan with scouts, engineers, patrols, and aerial reconnaissance. The S2 and the TF engineer continually refine the template based on hard intelligence. The task organization may be adjusted as more details of the defense and obstacle system are uncovered. This information is also used during the combined arms rehearsals.

Continuous and aggressive intelligence-gathering operations update the enemy template as available. These changes are reflected as soon as possible in the rehearsal area. If updates become available after the last possible rehearsal, this data must be passed immediately to the affected force elements, especially the breach force.

The TF meticulously plans, manages, and controls the rehearsals. The TF S3 allocates time for each unit to perform combined arms TF rehearsal. The rehearsal site reflects the actual obstacle system in as much detail as possible. The force chooses terrain as similar as possible to that of the operational area and constructs a practice obstacle system based on OBSTINTEL. Rehearsals include a leader and key personnel walk-through as well as individual rehearsals by support, breach, and assault forces. Where possible, the force rehearses the operation under the same conditions expected during the actual engagement, including battlefield obscuration, darkness, and inclement weather.

When the force commander rehearses the breaching operation, he also rehearses several contingency plans. The contingencies should include possible enemy counterattacks by templated counterattack forces and attack-by-enemy indirect-fire systems (artillery, rockets, attack helicopters, and other air assets). This also includes Threat use of nuclear, biological, and chemical (NBC) munitions.

Collecting Obstacle Intelligence

The success of a deliberate breaching operation depends heavily on the success of the R&S plan. The scheme of maneuver is based on known and templated intelligence of enemy positions and obstacles. NAIs are developed to confirm or deny the template. As hard intelligence reports come in, the template and R&S plan are updated and revised. The S2 develops the collection plan, with the scouts concentrating on confirming enemy locations. The engineers focus on gathering intelligence on obstacle orientation and composition as well as on the types of fortifications that might be constructed. Hard intelligence is used to refine the task organization of support, breach, and assault forces and the scheme of maneuver. For example, if scouts report that the possible breaching site is covered heavily by tanks, our

support force task organization would change to a tank-heavy force.

Executing

The force crosses the line of departure (LD) organized for the deliberate breach. If it encounters obstacles en route, it executes an in-stride breach with this organization. On arrival, TF scouts adjust artillery fires on the enemy positions to cover deployment of the support force. The support force moves in position and establishes its ABF position. Breach and assault forces move into position and prepare to execute their tasks. The TF commander continues to incorporate last-minute information into his plan and makes final adjustments of positions and locations.

The support force occupies his ABF position and immediately begins suppressing with a volley of fires. The support force FIST and TF FSO execute group targets planned on enemy positions. Mortar and artillery smoke are adjusted to obscure the breaching site from enemy target acquisition. The breach force begins movement once suppression and smoke are effective. Timing is critical, since the high volume of suppressing fires and smoke can only be sustained for a short duration. ABF positions have interlocking sectors of fires and are positioned to ensure the 3:1 suppression ratio on the enemy's positions (see *Figure 4-3*). Once suppression and obscuration have built to effective levels, the breach force moves forward to the breaching site (see *Figure 4-4*). The engineers create the lanes, while the combined arms breach force provides for local security. *Figure 4-5* shows a TF deliberate breach force organization. *Figure 4-6, page 4-8*, shows a TF deploying the breach force. *Figures 4-7 through 4-10, pages 4-8 through 4-10*, illustrate in detail the breach force establishing close obstacle security, breaching as many lanes simultaneously as possible and then securing the far side of the obstacle at the nearest defensible terrain. The assault force penetrates the objective after receiving the "Go Ahead" from the TF commander on the TF net. *Figure 4-11, page 10, and Figure 4-12, page 11*, show the assault force attacking through the lanes and a portion of the support force following to reinforce the main effort. Due to the complexity of the breach, the command and control systems are spread out to ensure synchronization. The TF S3 controls the multicompany support force, while the TF commander positions himself to best control the entire breaching operation.

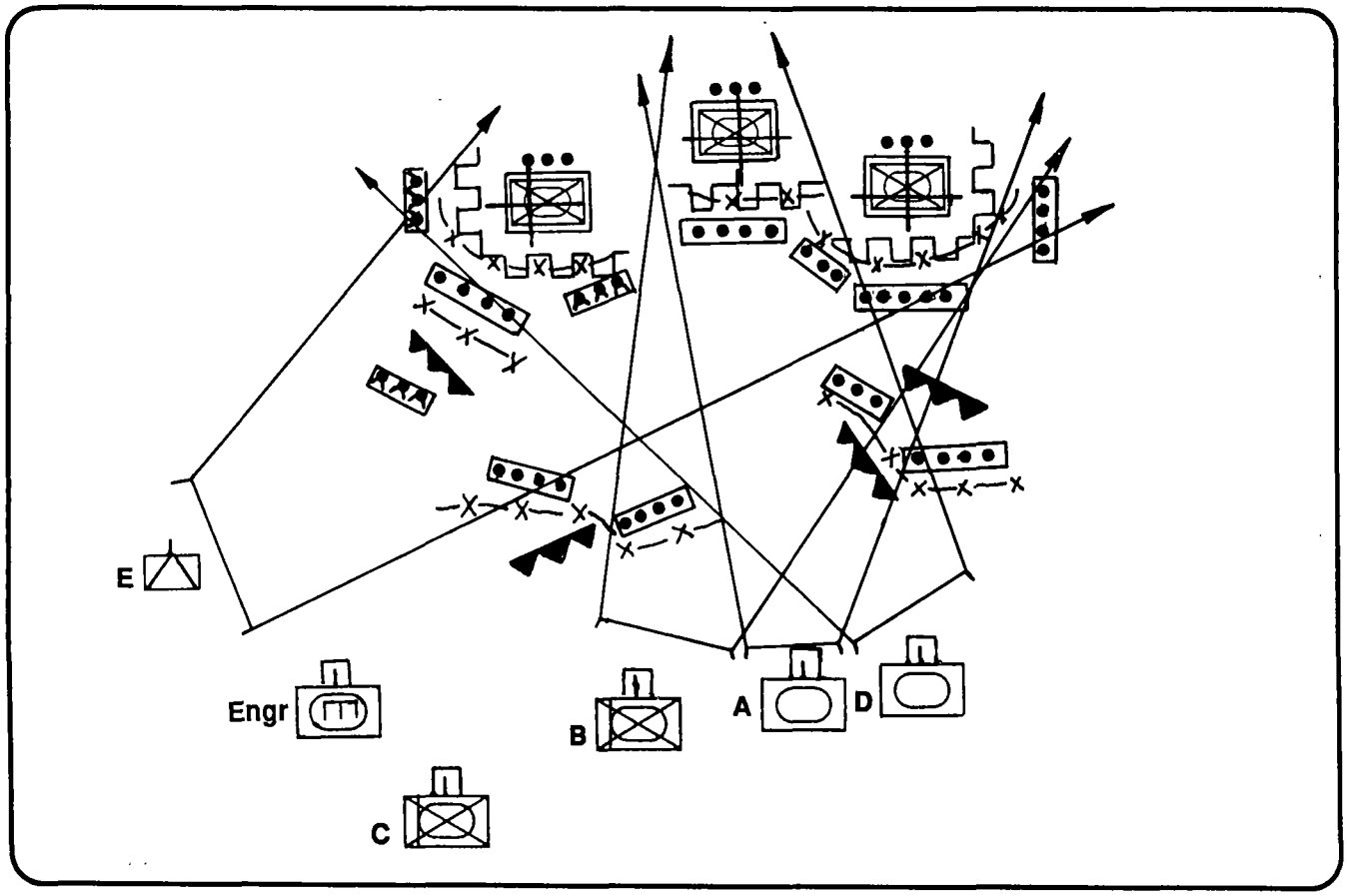


Figure 4-3. Suppression.

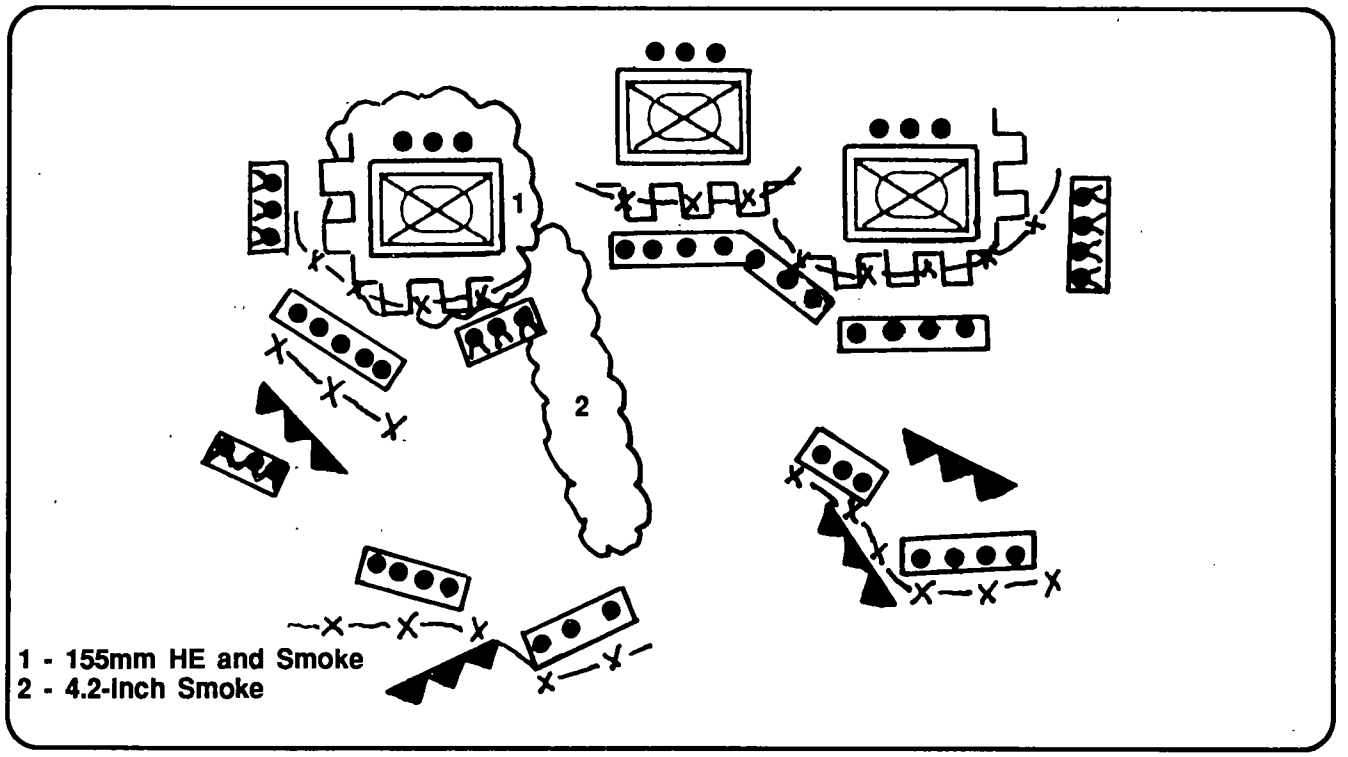


Figure 4-4. Obscuration.

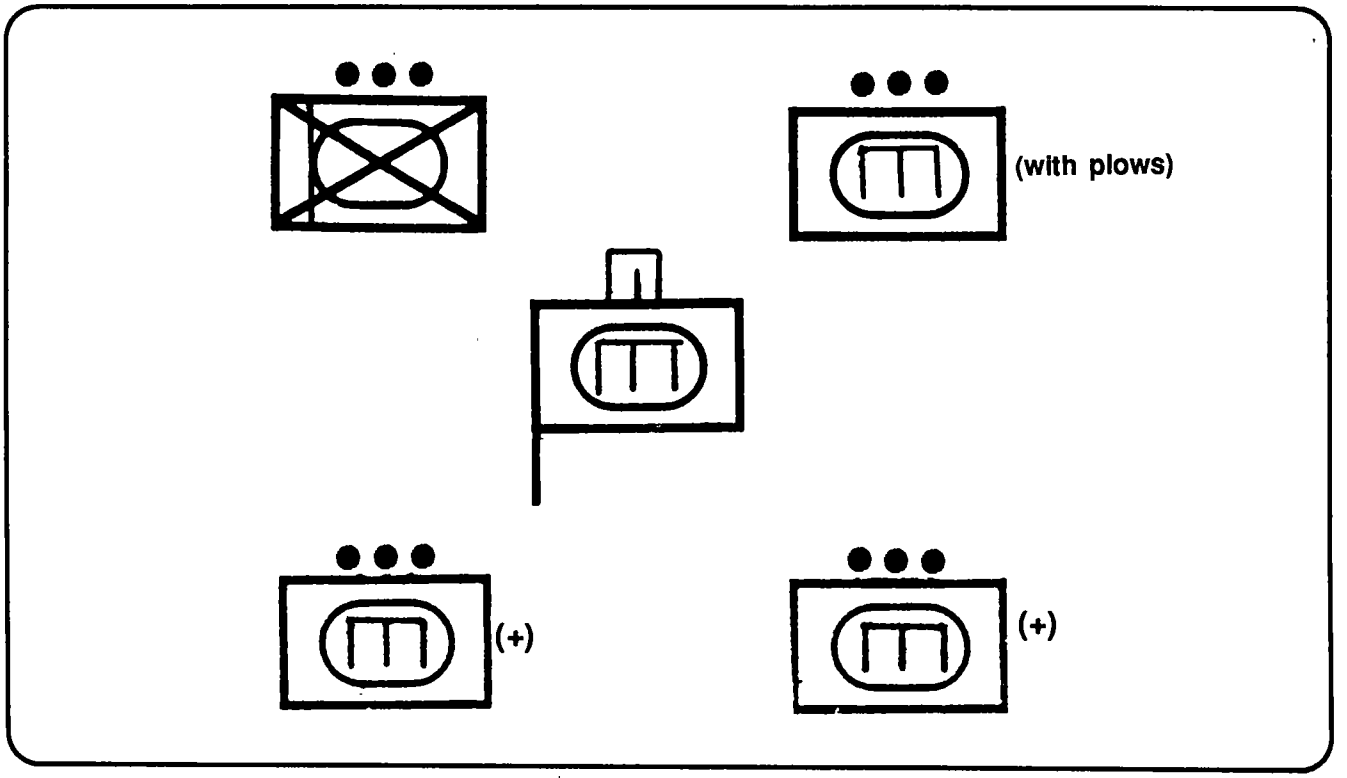


Figure 4-5. Organization of task force Mech deliberate breach force.

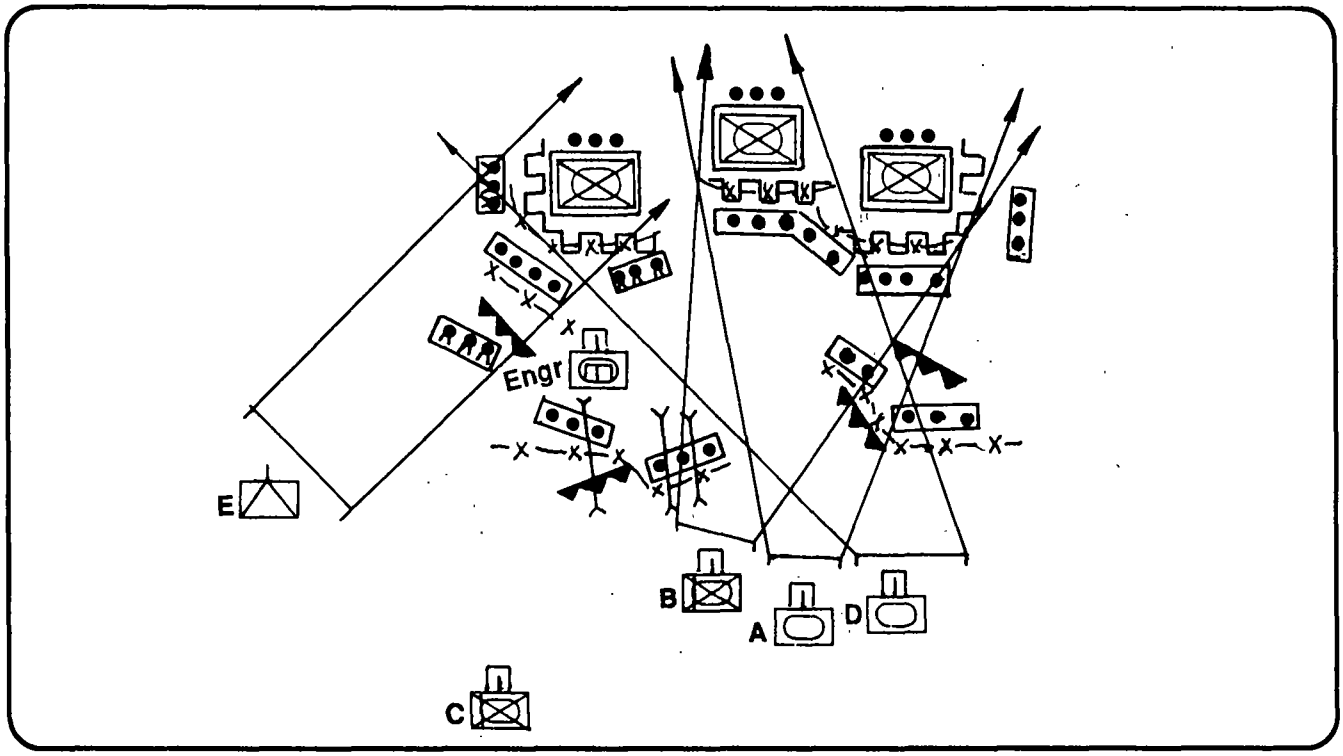


Figure 4-6. Breaching tactical obstacles.

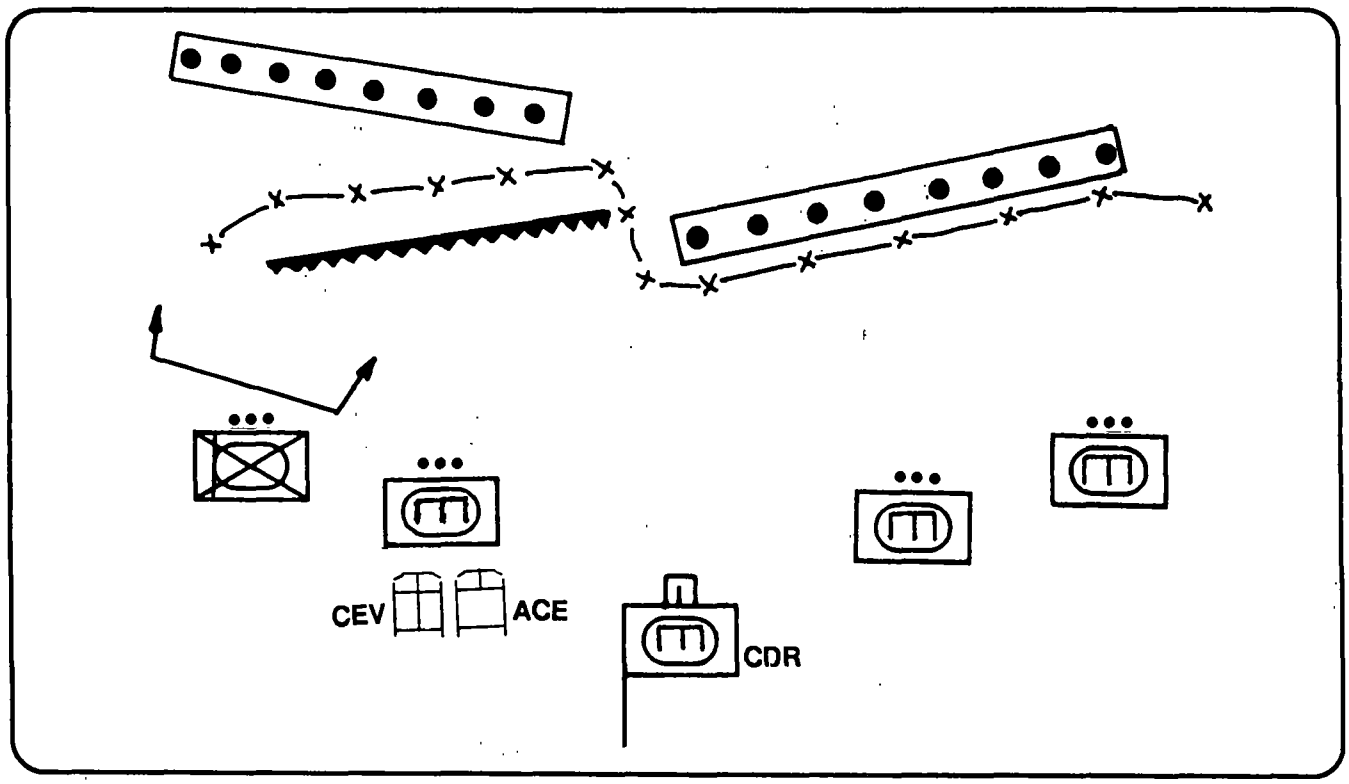


Figure 4-7. Breach force establishing close supression.

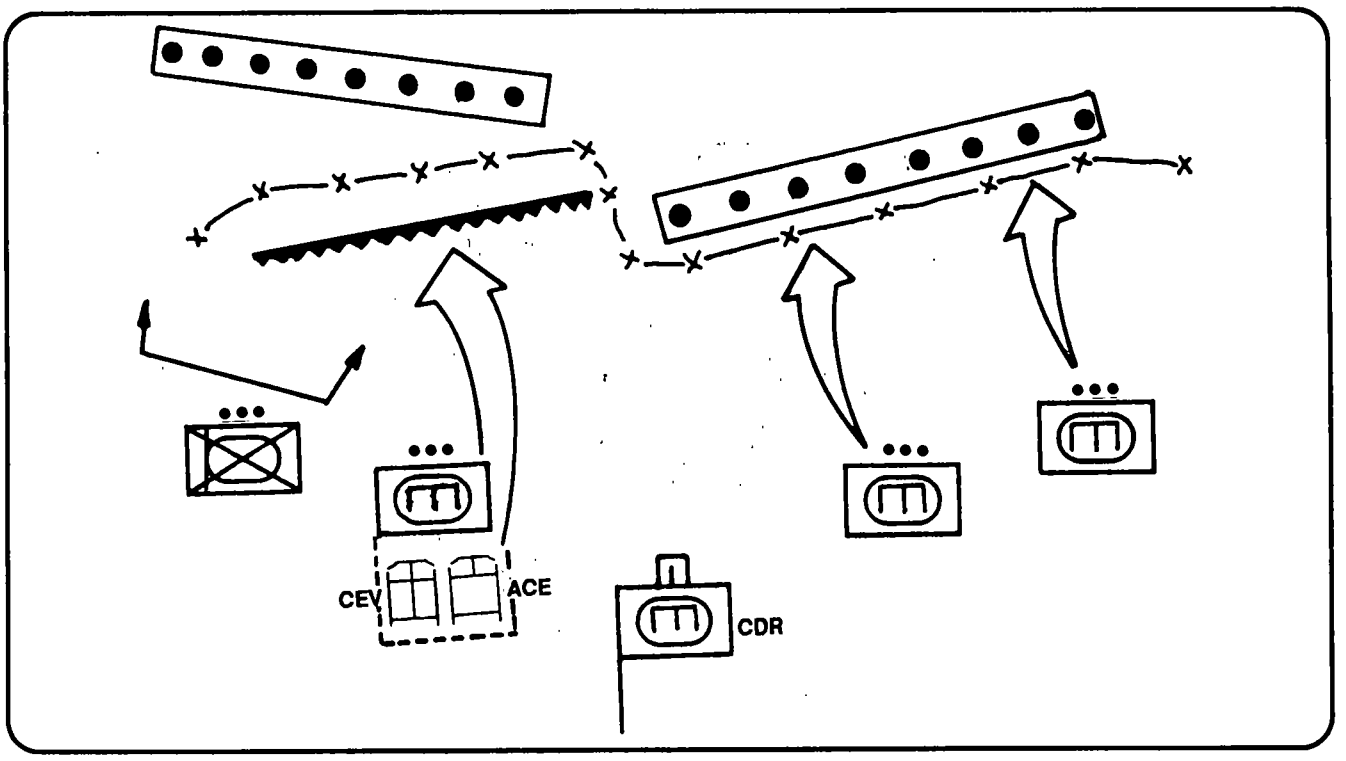


Figure 4-8. Breach force deploying to reduce lanes.

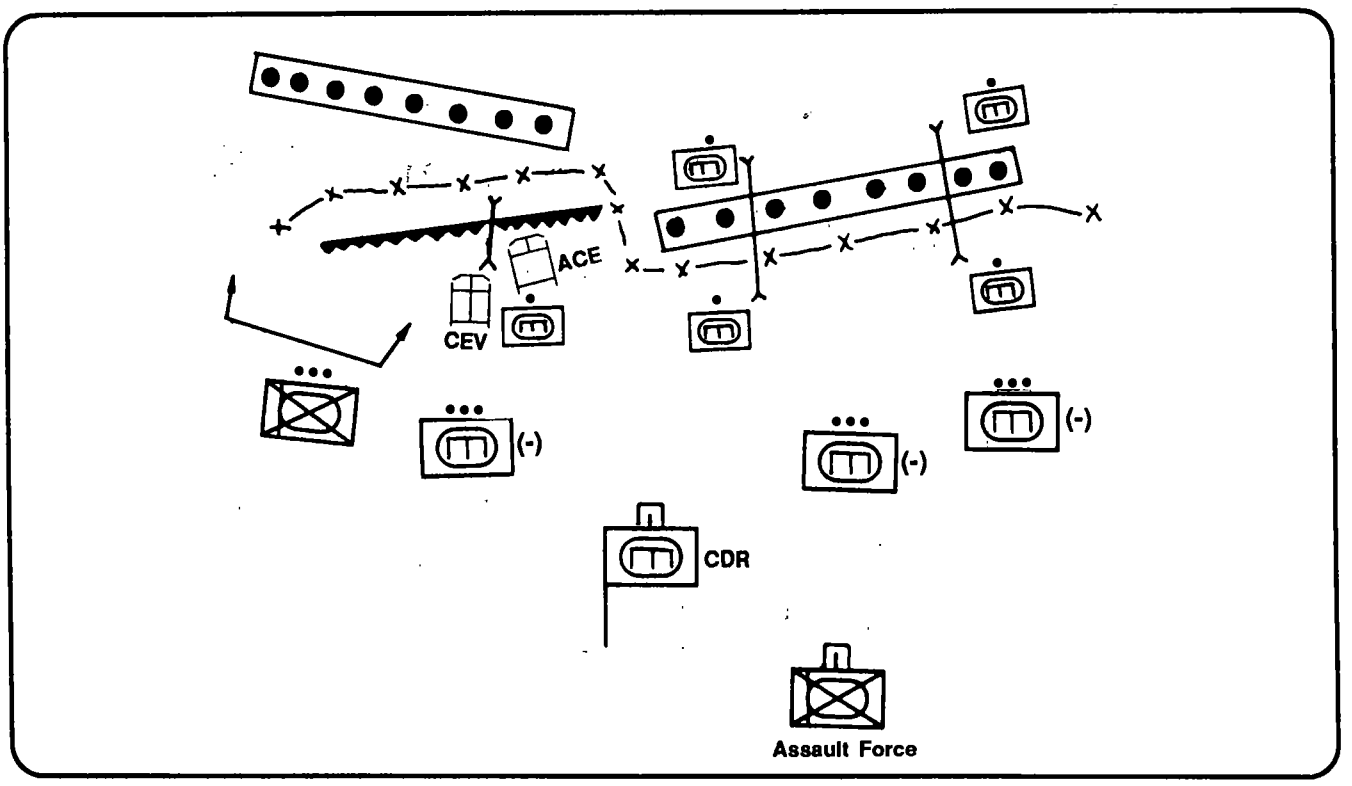


Figure 4-9. Obstacles reduced and deployment of assault force.

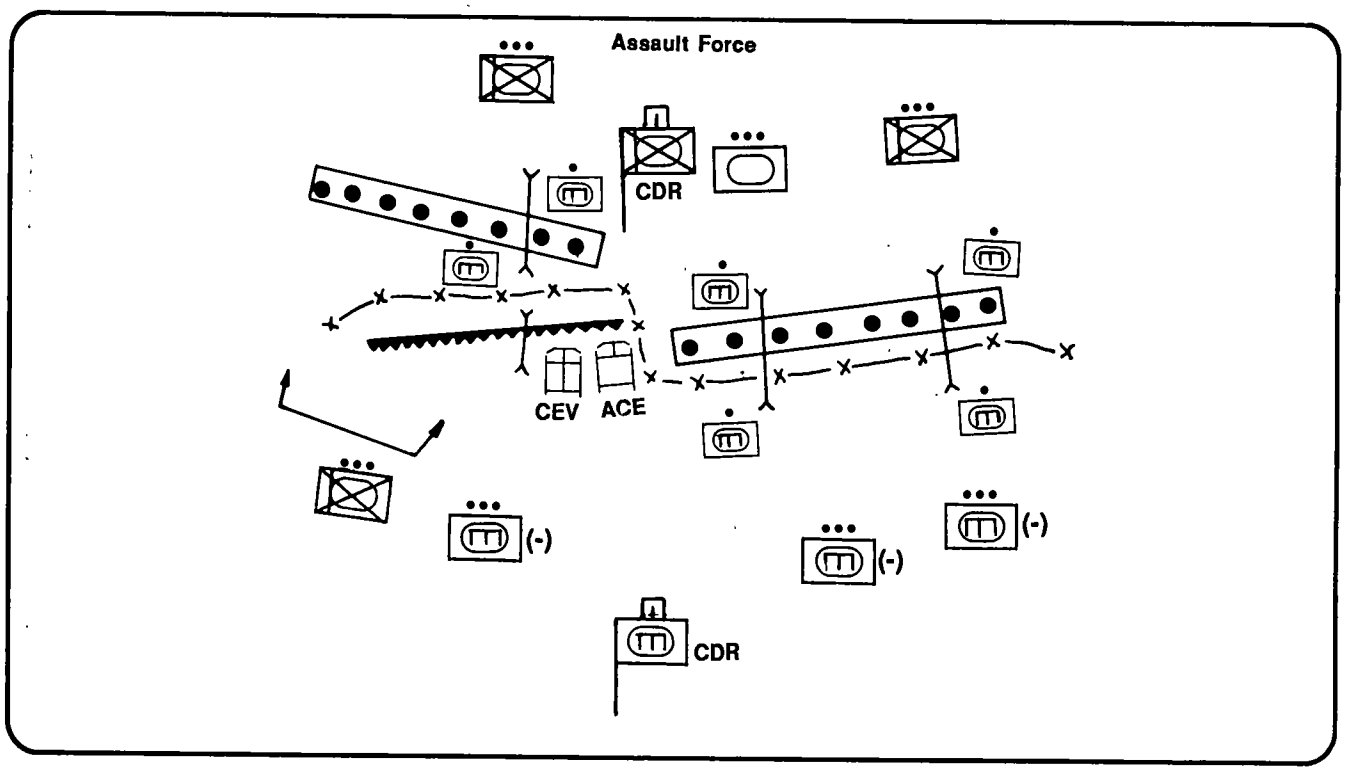


Figure 4-10. Assaulting through the lanes.

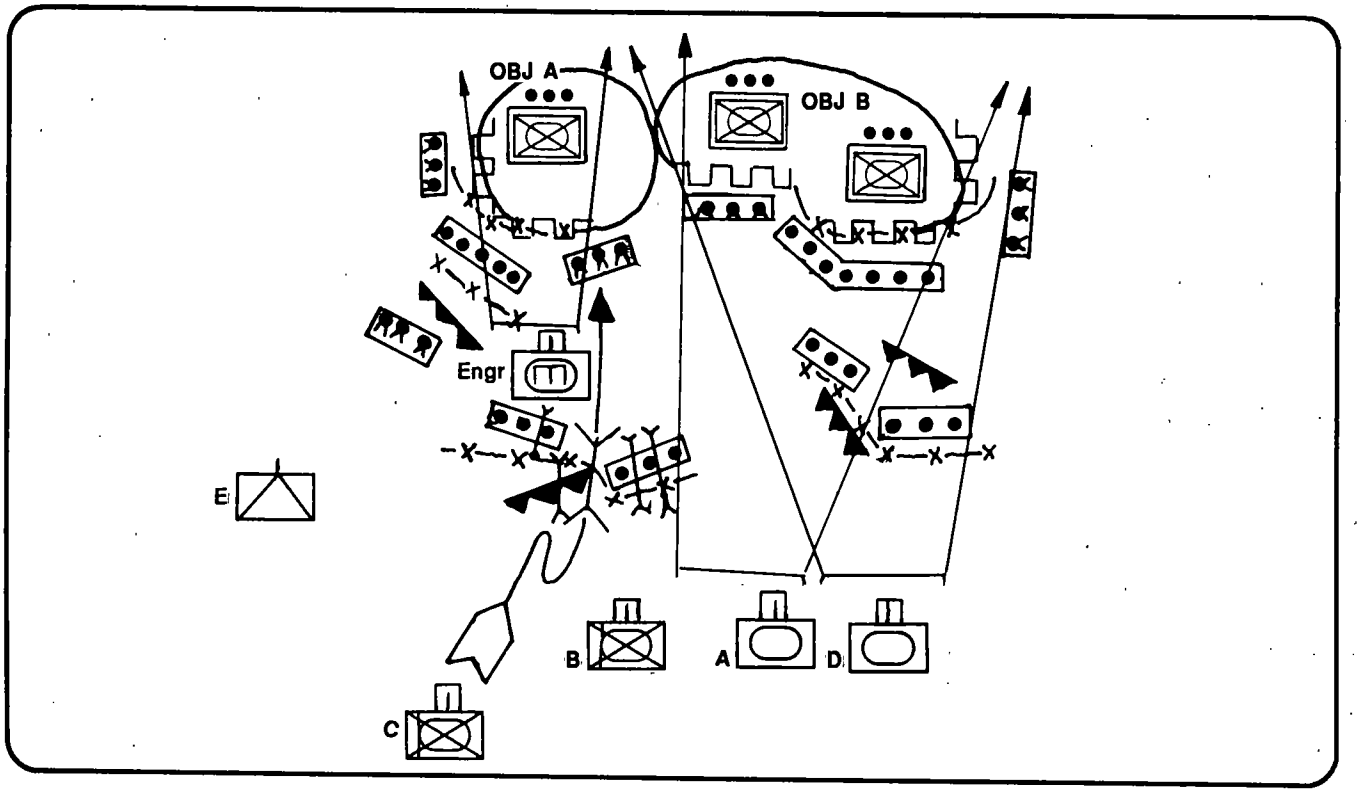


Figure 4-11. Assaulting the objective and seizing a foothold.

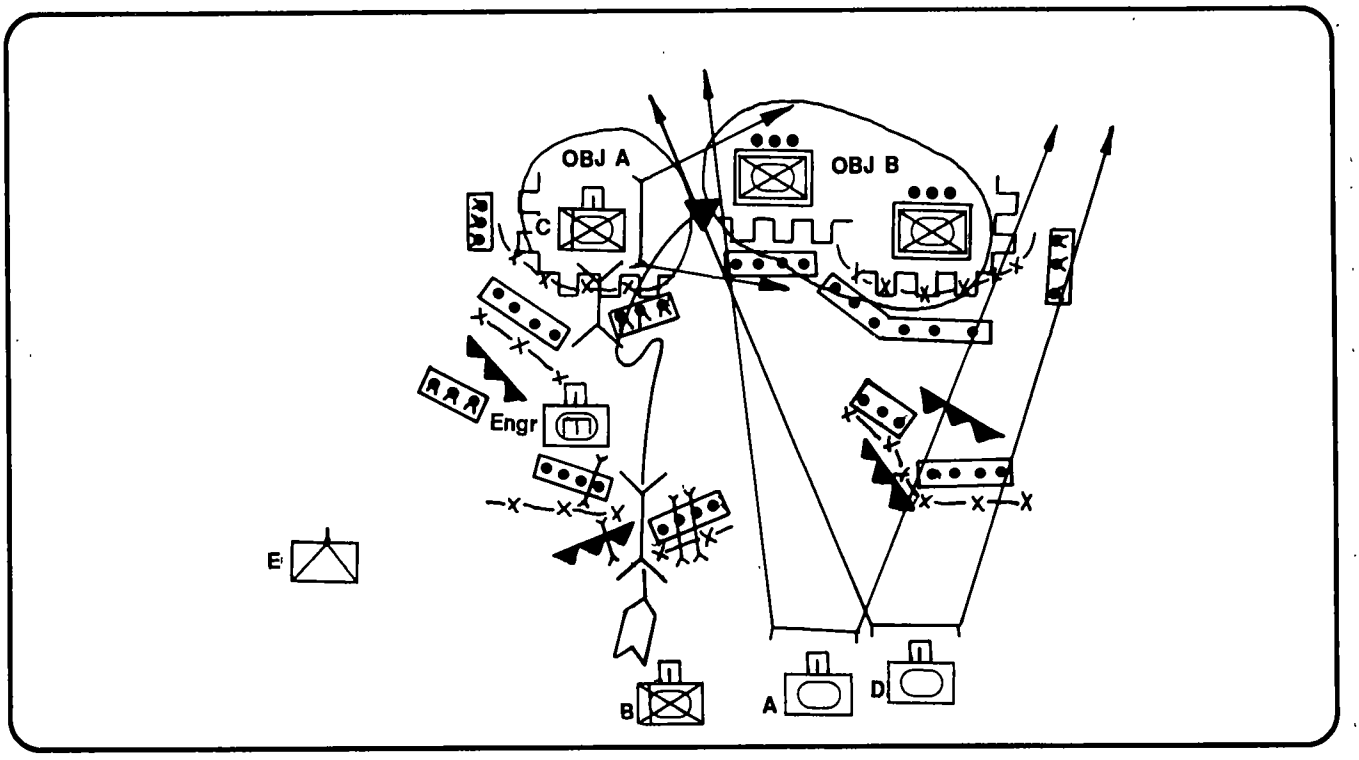


Figure 4-12. Exploiting the breach and actions on the objective.

Continuing the Attack

The obstacle system acts as a choke point and danger area even after the defenses have been overcome. Additional lanes are constructed to speed the passage of follow-on forces. Next, the lanes are widened to allow two-lane traffic through the obstacles. Switch lanes are constructed to prevent blocking by disabled vehicles or artillery fires. Deliberate marking and fencing systems are installed, and military police establish the necessary traffic control. Eventually, rear-area engineer forces clear the obstacles and eliminate the choke point. After passage through the lanes, the maneuver force continues its mission.

BRIGADE DELIBERATE BREACH

Brigade commanders use the deliberate breach against complex and strongly defended obstacle systems. A brigade conducts a deliberate breach using one or more task forces in support, breach, and assault roles. Breach task organization considerations and application of SOSR breaching fundamentals are the same as those discussed in the TF deliberate breach. The brigade scheme of maneuver must address how TFs maneuver to accomplish their support, breach, and assault missions. Since the brigade deliberate breach involves the maneuver of TFs, the brigade commander and staff are responsible for detailed planning, centralized rehearsals, and synchronization.

Figures 4-13 through 4-15 on page 4-12 show some possible variations of a brigade deliberate breach using four manuever battalions. In each case, one or more subordinate TFs have specific support, breach, and/or assault missions as part of the overall breaching effort. *Figure 4-14* shows the brigade using TF A to support while TF B breaches and assaults the brigade intermediate objective. Then TFs C and D, as the brigade assault force, attack the brigade main objective. The heavy-light brigade uses a light battalion (TF B) infiltrating to an assault position as the brigade breach force (see *Figure 4-15*). The breach force mission is to breach obstacles and seize the initial foothold into the brigade objective. The breach force attacks once the support force battalion (TF A) occupies its ABF position. The remaining two TFs (C and D) constitute the assault force and seize subsequent objectives of the brigade objective. These examples only cover deliberate breaches for a brigade; however, a brigade can plan a deliberate breach on the main attack axis and an in-stride breach on the supporting attack axis.

TASK FORCE DELIBERATE BREACH SCENARIO

The TF has just received the mission to secure OBJ Steel as part of a brigade's attack to destroy a templated motorized rifle battalion's (MRB's) hasty defensive position (see *Figure 4-16, page 4-13*). The TF S2 has received the intelligence update and IPB from the brigade. An MRC is templated in OBJ Steel. The TF S2 and engineer start the command and engineer estimate process, developing the necessary facts and assumptions to doctrinally template the

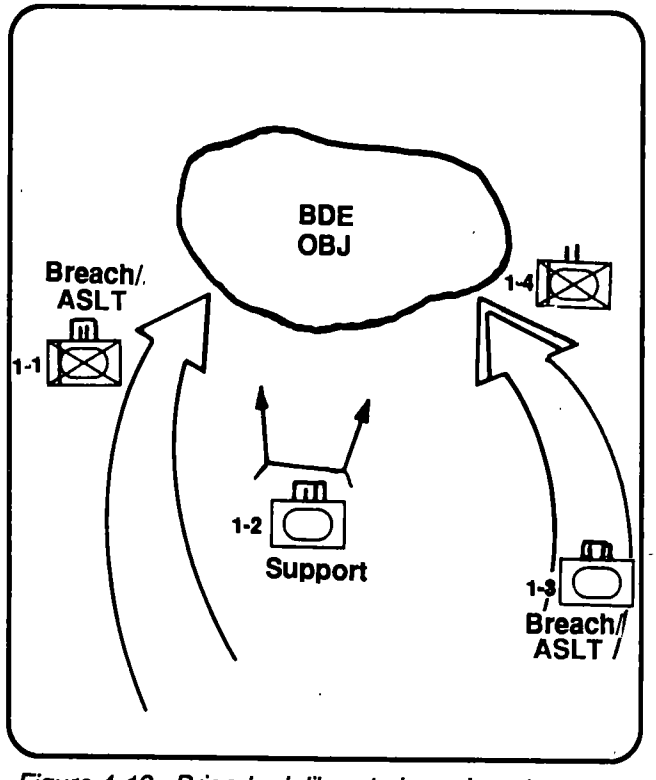


Figure 4-13. Brigade deliberate breach on two axes.

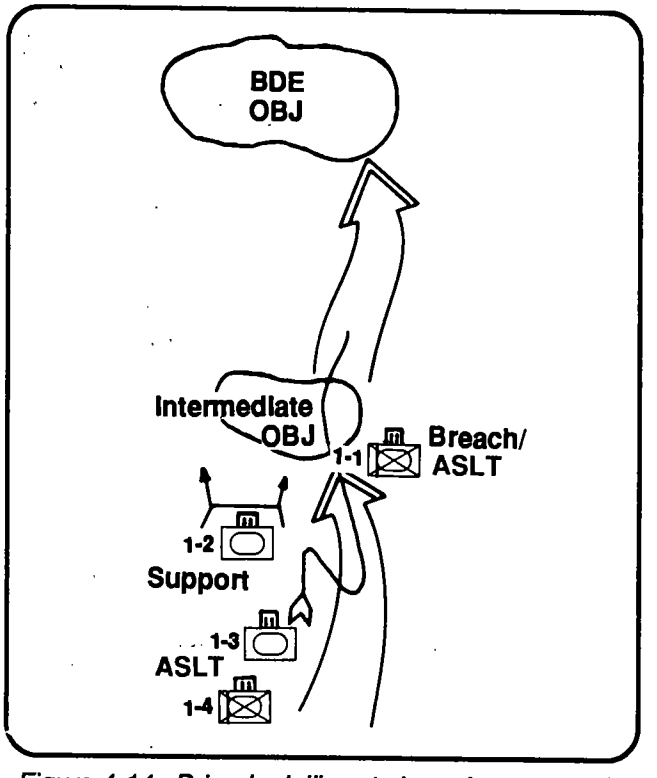


Figure 4-14. Brigade deliberate breach on one axis.

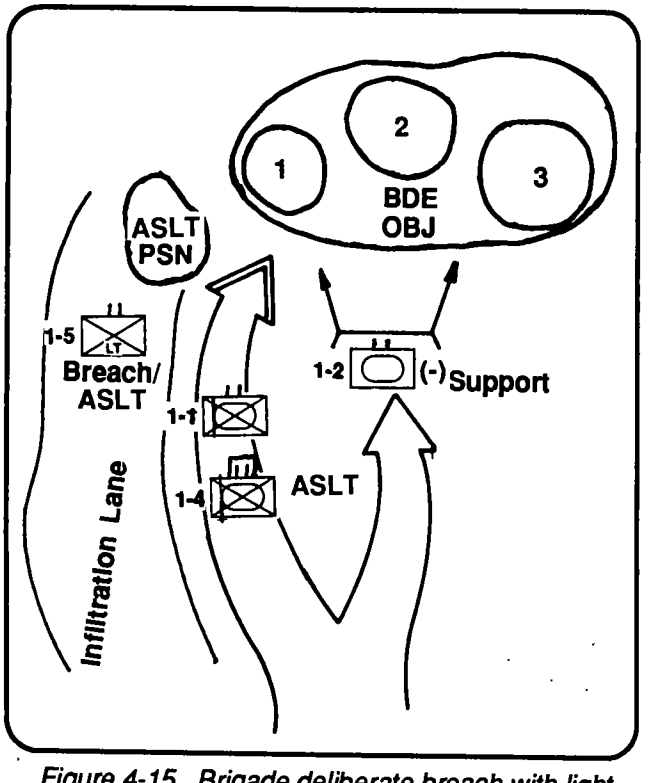


Figure 4-15. Brigade deliberate breach with light and heavy task forces.

enemy's forces and use of obstacles. They produce the situation template, which becomes the basis for developing a scheme of maneuver and engineer operations (see *Figure 4-17, page 4-13*). The S2 and engineer identify numerous NAIs to confirm or deny the situation template. OBSTINTEL and the location of direct-fire systems become the high PIRs. The S2 sends the scouts out with a squad of engineers to execute the R&S plan. The scout platoon leader uses the engineer squad specifically to reconnoiter NAIs confirming enemy obstacles, while the remainder of his platoon reconnoiters NAIs covering the templated enemy positions.

The TF battle staff develops three maneuver COAs. The TF commander chooses the COA which further subdivides OBJ Steel into three separate objectives (see *Figure 4-18, page 4-14*). The scheme of maneuver focuses on a company (minus) (Team Talon) fixing and destroying the enemy's two BMPs and one T72 located in the templated combat outpost (COP) (OBJ Cajun). The remainder of the TF bypasses the COP on Axis Sword; Teams Hawk and Falcon occupy ABF positions 21 and 22 to provide suppressive fires for the breach force (Team Castle). Team Castle creates lanes in the tactical obstacles and passes Team Eagle to seize OBJ Creole. Once OBJ Creole is seized, Team Falcon passes through and secures OBJ Gumbo with Team Hawk lifting fires. For details, see the execution matrix shown in *Figure 4-19, page 4-16.*

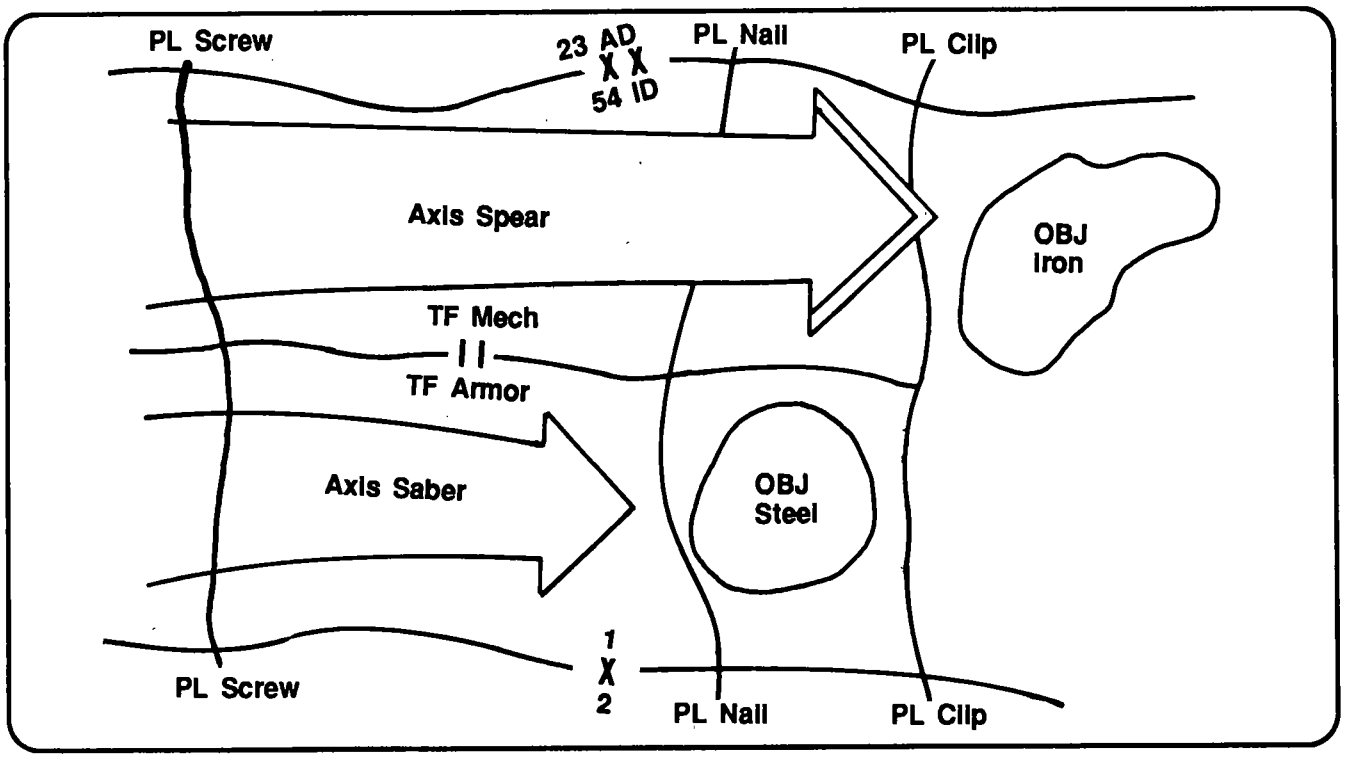


Figure 4-16. Brigade maneuver graphics.

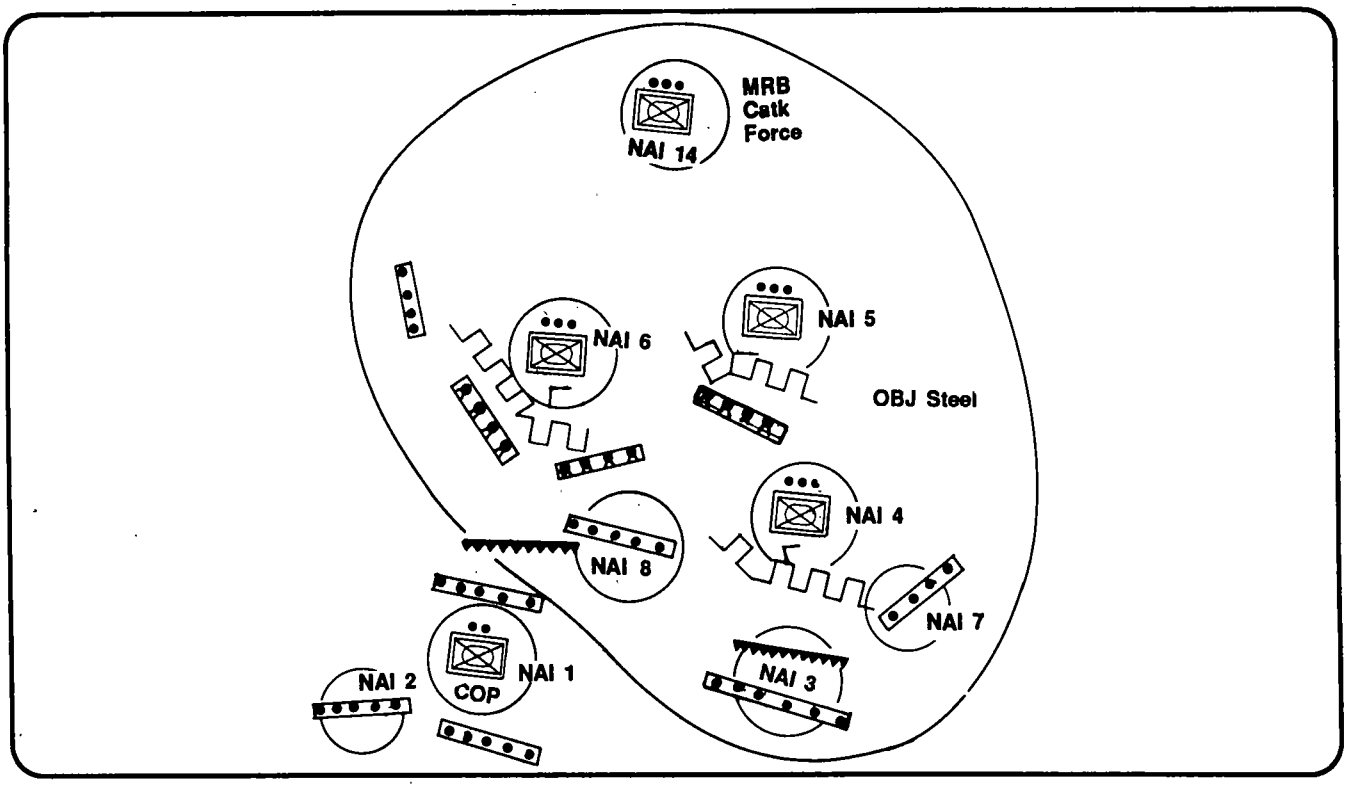


Figure 4-17. Situation template and R&S plan.

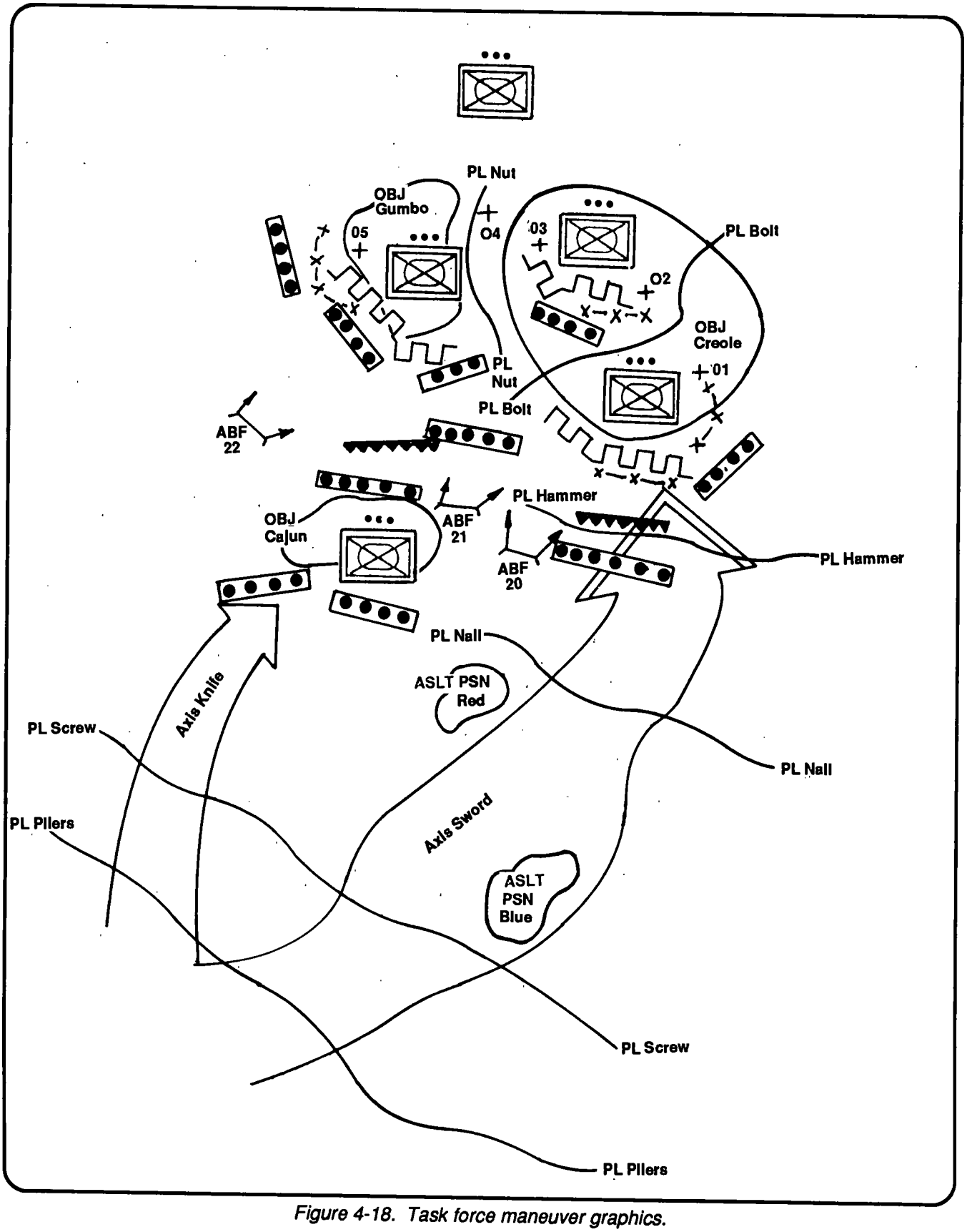


Figure 4-18. Task force maneuver graphics.

The TF engineer coordinates with the FSO for obscuration and suppressive indirect fires in support of Teams Talon, Hawk, Eagle, and finally Team Falcon. The priority of fires follows the TF's main effort. Stinger teams for air-defense coverage are allocated to Teams Hawk, Eagle, and Castle. This provides air-defense coverage for forces in ABF positions and during the defile at the breach—both likely targets for enemy air attacks.

As the planning process continues, the engineer company constructs three breaching lanes. Team Talon rehearses on one lane which has a low-density, surface-laid minefield portraying the COP. The TF (minus) rehearses on another more extensive rehearsal site. The site is large enough to allow the TF (minus) to rehearse occupying ABF positions and direct-fire control. The breach force is able to practice breaching a complex obstacle of wire, AP and AT mines, and AT ditches. Protective obstacles and trench lines are constructed at the end of the breaching lane. Teams Eagle and Falcon use this part of the rehearsal site to practice assaults on OBJ's Creole and Gumbo. The FSO participates in all rehearsals. The FSO ensures that the company and team FISTs understand the indirect-fire plan and how it will support the fight. When rehearsing the breaching operation, the force commander also rehearses several contingency plans at a sand table. The contingencies should include possible enemy counterattacks by templated counterattack forces and attack-by-enemy indirect-fire systems (artillery, rockets, attack helicopters, and other air assets). The rehearsal also includes enemy use of NBC munitions. Company teams rehearse immediate-action drills in the event that the TF has to breach in stride during movement. The S3 completes the rehearsals with a TF transition to a hasty defense.

The scouts and engineer squad continue to report enemy activities while the S2 and engineer adjust the situation template. The rehearsal lanes and planned indirect-fire targets are updated to match the intelligence. The ABF positions are also adjusted to ensure the best integration of direct fires for suppression. The chemical officer adjusts the smoke targets for the mortars to match the wind and weather data.

The TF crosses the LD PL Screw organized for a team-level deliberate breach at OBJ Cajun and a TF deliberate breach in the vicinity of PL Hammer. Teams Eagle and Falcon are organized for assault breaches at OBJs Creole and Gumbo. The TF scouts adjust artillery fires on the enemy's positions to cover Team Talon and the support force (Teams Hawk and Falcon). Team Talon, organized with an engineer platoon (two squads) and one tank plow, reports successful suppression and the start of two breaching lanes. This keys Teams Hawk and Falcon to cross PL Nail to occupy their ABF positions. The TF commander incorporates last-minute information into his plan and makes final adjustments of positions and locations.

The support force begins suppression and obscuration. The TF provides obscuration from supporting 155-millimeter fires and from organic 4.2-inch mortars. Since the FIST from Team Hawk has the best view of the breaching location, he controls the mortar smoke. He requests a combination of 155-millimeter smoke and HE from the FSO. The TF commander positions himself with Team Falcon to best control the fight, enabling his FSO to assist in coordinating the use of indirect- and close-air support. An AT platoon, attached to Team Hawk from the infantry battalion, adds precision fires against dug-in fighting vehicles.

The TF has employed an engineer company (minus) task organized with a mechanized infantry platoon and the remaining two tank plows and roller as the breach force. The engineer commander maneuvers the infantry forces to provide local security and protection against templated counterattacks. He quickly commits his breaching assets. The BIFV provides overwatching fires to cover the tank roller while the main gun is traversed to the rear. The engineer creates two lanes each. The engineer company commander reports to the TF commander that the lanes are open. To mark the breaching location, the breach force uses colored smoke as a far recognition signal; simultaneously, engineers construct the lane markings. The TF commander commits the assault force, Team Eagle, to seize OBJ Creole; the support force shifts fires to TRPs ABO2 and AB03. Team Talon reports that OBJ Cajun is clear and moves to his ABF position as the TF reserve. Team Falcon passes through the breaching lanes, picking up the tank plows and rollers, and assaults through the protective obstacles to destroy the isolated enemy platoon (see *Chapter 5*).

	Falcon	Hawk	Talon	Eagle	Castle	Scouts	C^2
Units	1/B 2/B 3/C 2	1/A 2/A 1/E	1/C 3/B 1/A(-) 3	1/D 2/D 3/D 3/A 3/A	2/A 3/A 2/C	1 2 3 1/1/A 1	
PL Pliers **PL Screw**	Axis Sword Lead right	Axis Sword Lead left	Axis Knife Orient Cajun	Axis Sword Trail Castle	Axis Sword Center TF(-)	Adjust indirect OBJ Cajun	TF CDR with Falcon S3 with Eagle
PL Screw **PL Nail**	PL Nail O/O OCC ABF 20	PL Nail O/O OCC ABF 21	Axis Knife Seize OBJ Cajun	Assault Position Red Orient northeast	Assault Position Blue Orient north	Adjust indirect OBJ Creole	
Breach **at** **PL Hammer**	ABF 20 Orient 01-03	ABF 21 Orient 02-04	ABF 22 Orient 04-05	Assault Position Red Orient northeast	Breach vicinity PL Hammer (3 lanes)	NAI 14 Report counter- attack	TF CDR with Falcon S3 with Castle
Assault **OBJ Creole**	ABF 20 O/O shift 02-04	ABF 21 02-04 O/O shift 04-05	ABF 22 04-05	Seize OBJ Creole Report PL Bolt	Pass Eagle thru lanes	NAIs 14, 15, 16	
OBJ Creole **PL Bolt**	Lift fires B/P assault OBJ Creole	ABF 21 04-05 O/O lift fires	ABF 22 04-05 O/O lift	OBJ Creole PL Bolt Report PL Nut	B/P Pass Falcon		
OBJ Gumbo	Pass thru Eagle Pick up plows and roller Seize OBJ Gumbo	ABF 21 O/O lift fires B/P Assault OBJ Gumbo	ABF 22 O/O lift B/P Orient northwest	Consolidate OBJ Creole Detach plows and roller to Falcon	Pass Falcon B/P Pass Hawk		
Consolidate	OBJ Gumbo Orient north	PL Hammer Orient east	ABF 22 Orient northwest	OBJ Creole Orient northeast	Improve lanes Pass TF combat trains thru B/P countermobility	Detach engineer squad	TF CDR with Eagle S3 with Hawk

Figure 4-19. Task force execution matrix.

Chapter 5
Assault Breach

The assault breach allows a force to penetrate an enemy's protective obstacles and destroy the defender in detail. It provides a force with the mobility it needs to gain a foothold into an enemy defense and exploit success by continuing the assault through the OBJ. The assault breach is conducted by company teams and platoons assigned the mission of assaulting an OBJ as part of a larger force's attack. The nature of combat during the assault phase requires a different application of the SOSR breaching fundamentals than that used during in-stride and deliberate breaches. The TF commander still provides the company team or platoon with the support, breach, and assault assets it needs to accomplish the mission. However, he also task organizes his own support force to suppress the enemy during the breach and isolate the assault OBJ area.

Every attack ends with some form of assault unless the enemy position is destroyed by gunfire or the mission allows bypassing the position. When the enemy has a prepared defense complete with protective obstacles, conducting an assault breach becomes an implied task essential to mission accomplishment. The assault breach may be conducted to support either a mounted or dismounted assault. A mounted assault is the preferred technique if the enemy is very weak. However, the commander must weigh the advantages of conducting a mounted assault against the danger of sustaining heavy casualties from just a few dismounted close-range antiarmor weapons.

The company team or platoon commander plans, prepares, and executes an assault breach when the—

- Enemy has had time to prepare protective obstacles around or within its positions.
- Company team or platoon has been assigned the mission to assault an enemy's defense as part of a larger force's actions on the OBJ.

NATURE OF THE ASSAULT

The nature of enemy fires and obstacles within a prepared defense makes the assault the most dangerous and confusing phase of any attack. The nature of the enemy defense requires the attacker to fight through extensive protective obstacles and fortifications covered by interlocking small-arms fires and close-range antiarmor weapons. Typically, a Soviet-style defender emplaces protective obstacles 50 to 500 meters in front of its positions and between its forward platoons and companies. These obstacles are designed to prevent a mounted assault and to fix or break up a dismounted assault. Close-in obstacles are a combination of wire, AP and AT mines, fortifications, and entrenchments. All are well-covered by heavy machine-gun fires. Mines may be surface-laid but are probably buried and well-camouflaged. Mines can also be deployed with antihandling devices or can be trip-wire activated.

The attacker initiates the assault by massing overwhelming combat power at a point that cracks the integrity of the defense. Once a foothold is gained, the attacker continues the assault by seizing squad- and platoon-sized OBJs, clearing infantry trench lines, and destroying bunkers. With each OBJ, assaulting squads and platoons will encounter protective obstacles; footpath lanes are required to continue the attack. The attack quickly becomes a decentralized fight, with the momentum of the assault being carried by squad and platoon actions.

Maintaining the momentum of the assault is critical to preventing the defender from reinforcing the point of penetration. The defender knows the ground and organization of his defense and can quickly shift his fires or reposition his forces in reaction to a penetration. The assaulting force cannot afford to be fixed or delayed by protective obstacles that will allow the defender time he needs to react to the attack. Maintaining the momentum of the assault prevents the defender from having the time to effectively organize and launch a counterattack from within his position that would threaten the attacker's foothold.

The human reaction to battle and immediate enemy contact hampers the leader's ability to command and control his assaulting forces. Once lead soldiers of an assaulting platoon or squad engage, their attention becomes focused on the fires and movement of the enemy. The span of command and control of a leader in contact quickly shrinks to those forces in his immediate area of personal influence (squads and platoons). Directional control of formations becomes more difficult as assaulting squads and platoons move into, around, and through close-in obstacles and fortifications.

ASSAULT BREACHING FUNDAMENTALS

The decentralized nature of the assault is reflected in the application of the SOSR breaching fundamentals in the assault breach. Company team and platoon assault breach planning, preparation, and execution focuses on the platoon and squad. The assault force commander allocates engineer sapper teams, breaching equipment, and demolitions to squads and platoons providing breaching capability

throughout his force. A squad or fire team within a squad provides suppressive fires with their organic weapons while another squad or fire team assaults through the footpath breach. In general, the protective obstacle's close proximity to the enemy position makes it impossible to secure the breaching site by force. In short, maneuver during an assault is done by platoons with squads, and assault breaches are conducted by squads under the control of platoons.

Suppress

Suppression is used during the assault breach to neutralize enemy positions bringing fires on the breaching site and to fix enemy forces attempting to reinforce the point of penetration. Effective suppression during an assault breach, therefore, occurs at two levels. The commander planning an assault must dedicate a force to focus supporting fires on subsequent OBJs. For instance, a company team commander may use his BIFVs or supporting tank platoon to attack by fire on the next platoon OBJ while his dismounted infantry assaults. The primary mission of the support force is to isolate the breach from reinforcements. The second level of suppression is provided by the assaulting force itself. The platoon encountering the obstacle executes an action-on-contact drill and returns focused volley fires on the enemy positions firing on the breaching site.

Obscure

Mortars are the primary means of obscuration in the assault breach. Like suppression, smoke is used to hamper the ability of the enemy to bring effective fires on the assault breach. It also conceals the location of the breaching effort, delaying the enemy's decision to counterattack. It is difficult to use smoke to obscure enemy fires on the obstacle during the breach because of the close proximity to friendly troops. Using a combination of HE and smoke as the last rounds completed during an artillery preparation on the assault OBJ is a good technique. This establishes a haze within the OBJ, offering some obscuration to conceal the assault. Mortar smoke is then executed "on order" just before assaulting forces reach protective obstacles. If wind conditions are favorable, the support force may establish a smoke line using smoke pots. Mortar fire is shifted from the initial assault OBJ and a combination of HE and smoke or just smoke is fired on subsequent platoon OBJs. The assault force employs hand-held smoke grenades and smoke pots as part of their breaching drill.

Secure

The assault breach is usually secured by fires rather than by force. An assault force breaching a protective obstacle is typically receiving intense small-arms fires from nearby enemy positions. The assault force cannot afford the time and combat power required to bypass the obstacle and secure the far side by force. Security is achieved by heavy volumes of fire delivered by the platoon and squad weapons of the assault force in close overwatch and the support force in far overwatch. Again, the support force focuses on the far side, isolating (securing by fire) the breaching site from enemy reinforcement.

Reduce

Reduction in the assault breach refers to creating dismounted lanes in protective obstacles, reducing fortifications, and widening lanes to support mounted forces. Dismounted breaches are created in protective obstacles by dismounted engineers and infantry in the assault force. The commander task organizes the assault force with sufficient assets to breach a minimum of one lane per assaulting platoon. This rule of thumb is the same for either a mounted or dismounted assault. An engineer squad supports an assaulting platoon and breaches a dismounted lane in the protective minefield while the platoon lays a base of fire.

As the platoon gains entry into the enemy's fortifications, the engineer squad splits into two sapper teams maneuvering with the two lead squads. This gives the lead squads, which are clearing a trench line, a dedicated force to neutralize booby traps and destroy enemy fortifications and equipment.

ENGINEER INTEGRATION INTO THE ASSAULT FORCE

Engineers contribute to the assault in four major areas. They—

- Conduct decentralized obstacle reduction to maintain the mobility of the assault force and momentum of the attack.
- Reduce fortifications with demolitions, making them unusable by enemy forces.
- Widen initial assault breaches to permit follow-on mounted forces to move on or through the OBJ.
- Hand over assault lanes to follow-on forces for widening and for improved marking.

Engineers are integrated into the assault force to provide decentralized, responsive support at the lowest possible level within assault forces. This is a sharp contrast to the in-stride and deliberate breach, where engineer platoons operate as a unit under the control of the platoon leader. Limited visibility, concentrated direct and indirect fires, and the confusion of dismounting and assaulting an OBJ all hamper command and control. There is insufficient time and command and control at the probable line of deployment (PLD) to reorganize engineers and other equipment for an assault breach. Therefore, engineers supporting an assault force move already task organized; engineer squads move mounted or dismounted as part of the infantry platoon they

will support. When dismounted, the assault force commander may choose to have his engineer squads split into sapper teams, each moving with a squad. However, this may reduce responsiveness at the breach as the two sapper teams link up to effect a breach in a minefield.

After breaching footpath lanes through protective obstacles, engineers and assault platoons continue to fight through the defensive position. At this point engineers are decentralized, with sapper teams supporting the squads. The sapper team moves directly behind the clearing team. It assists in neutralizing bunkers using bangalore torpedoes, pole and satchel charges, and combat demolition charges (primed blocks of composition 4 explosives (C4) or trinitrotoluene (TNT) carried in rucksacks or demolition bags). The sapper team uses its M203 to mark bunker targets for supporting CEVs. As the clearing team neutralizes each bunker, the engineers destroy the bunker and equipment. If the clearing team encounters booby traps, the sapper team is in a position to quickly respond. When assaulting in military operations on urbanized terrain (MOUT), the sapper team uses demolitions to assist the clearing team in gaining entry through walls, doors, floors, roofs, and so forth.

CONSOLIDATION

The final stage in the assault is improving the initial lanes through protective obstacles to allow follow-on mounted or dismounted forces to penetrate the position and attack the next OBJ. The assaulting engineer plans to hand lanes over to follow-on engineer forces as soon as possible. The follow-on engineer then widens and marks the lane to help guide the passing unit to and through the lanes. Dismounted engineers from the follow-on force travel immediately behind the assault force to begin their tasks without delay.

During consolidation of the assault force, the priority of engineer effort is to mark lanes and bypassed minefields in order to help with consolidation and passage of follow-on forces. This is an extremely important phase. In the aftermath of an assault, forces are scattered throughout the OBJ. Consolidation is critical to reestablishing command and control as well as effecting casualty evacuation and resupply. A force's ability to move within the OBJ with little risk of sustaining additional mine casualties depends on well-marked breaching lanes and bypasses. Furthermore, forces carrying the fight to the next OBJ must be able to quickly move through and around protective obstacles and initiate their own assault with command and control intact.

HEAVY COMPANY TEAM ASSAULT BREACH SCENARIO

The TF commander designates Team A as the TF assault force for the TF deliberate breach (see *Figure 5-1, page 5-4*). Team A's mission is to attack to seize OBJ Green. The team is task organized with two mechanized platoons, one tank platoon, and a platoon of mechanized engineers. The situation template indicates an MRP-sized force in a well-prepared defense on OBJ Green, complete with protective obstacles and entrenchments. Team A's commander plans and prepares his company team to conduct an assault breach as part of his actions on the OBJ.

Team A assaults through the lanes in the enemy tactical obstacles and begins its assault on OBJ Green. When Team A reaches its PLD, the tank platoon immediately begins volley fire on OBJs Green 1 and 2. Each of the two infantry platoons arrives at the PLD already organized with a mechanized engineer squad that maneuvers as part of the platoon formation. As the infantry and engineers dismount, the engineers split into two sapper teams, and each of them joins a squad formation. The BIFVs from the 2nd Platoon join the tanks as a support force suppressing OBJs Green 1 and 2. The other platoon's BIFV provides overwatch for the dismounted assault. As the preparation fires lift, Team A (minus) begins its assault; the support force shifts fires to OBJs Green 2 and 3.

The lead platoon encounters a mine and wire obstacle and is engaged by heavy machine-gun fire. Using his own tracer fire, the 1st Platoon leader directs the fires of two squads and an M60 machine gun. An M203 red smoke designates the target for the overwatching BIFVs to suppress. The sapper team sets charges on the POMZ-2M AP mines and breaches a footpath through the mines and wire. The platoon leader gives the command for one of his squads to assault through the lane and gain entry into the trench. Before the enemy has time to shift forces, OBJ Green 1 is cleared by the 1st Platoon. The 2nd Platoon moves through OBJ Green 1 with its attached engineer squad split into sapper teams. These teams then breach into the next trench work and clear OBJ Green 2.

LIGHT-HEAVY TASK FORCE ASSAULT BREACH SCENARIO

TF Light has the mission to attack to seize OBJ Zulu as the brigade's initial main effort. The brigade and TF intelligence collection confirms that the enemy on OBJ Zulu is an MRC (plus) defending from well-fortified positions. The TF S2 and engineer revise their template based on the available hard intelligence. TF Light is task organized with two light infantry companies (A and B), a tank-heavy team (Team Tank), and a light-heavy engineer team (Team Sapper).

The TF Light commander and staff develop several COAs. After considerable war-gaming, the commander adopts a COA as his scheme of maneuver (see *Figure 5-2, page 5-5*). TF Light infiltrates Companies A and B to an assault position using the infiltration lane. Team Tank attacks on Axis Strike and occupies ABF position 07, orienting on OBJ 1. Company B occupies ABF position 08, orienting on OBJ 1, while

Company A assaults OBJ 1 (main effort). Team Tank shifts fires to OBJs 2 and 3 as Company A crosses PL Bayonet. On order, Company B passes through OBJ 1 and becomes the main effort assaulting OBJ 2; Team Tank shifts fires to OBJ 3. On order, Team Tank passes through OBJs 1 and 2 and seizes OBJ 3.

Based on the situation template and TF scheme of maneuver, the engineer recommends organizing Companies A and B for an assault breach. A light engineer platoon is attached to both Companies A and B. Team Tank is task organized with a heavy engineer platoon to provide mobility along Axis Strike and to breach enemy tactical obstacles into OBJ 1.

Company A's mission is to seize OBJ 1 to gain a foothold for the TF attack on OBJ Zulu. To accomplish the mission, Company A must assault breach the enemy's protective obstacles, gain entry into the enemy trench line, and defeat the MRP in detail. The company commander plans to simultaneously assault OBJs 1A and 1B with the 1st and 2nd Platoons respectively. This enables him to exploit the element of surprise and rapidly gain entry into OBJ 1 (see *Figure 5-3*). The 3rd Platoon attacks by fire and "on order" attacks through OBJ 1B to seize OBJ 1C. The commander cannot afford the delay of a deliberate breach at the protective minefields; he chooses to task organize each of his platoons with a light engineer squad for an assault breach. The company's mortars will establish a firing position at PL Bayonet.

The commander of Company A coordinates his assault breach plan with Team Tank, Company B, and the TF FSO. He knows that artillery fires will shift from OBJ 1 when he crosses PL Bayonet. The commander coordinates with the FSO for the mortars to fire a combination of HE and smoke on OBJ 1 as artillery fires lift. These mortar fires obscure and suppress the enemy during his assault breach. He coordinates with Team Tank and Company B to concentrate their fires on any enemy movement in OBJs 2 or 3 threatening a counterattack on OBJ 1.

The commander focuses his unit's breaching preparations at the platoon level. The engineer platoon links up early, attends the OPORD, and cross-trains breach and bunker-reduction drills with the infantry squads. The engineer platoon leader constructs an AP and AT minefield similar to the one encountered in a previous attack for platoon rehearsals. One platoon arranges itself in a defensive position while the other platoons rehearse their assault breach and trench-clearing drills. All rehearsals are conducted by combined arms. Engineer squads are included in platoon rehearsals of actions on contact, actions on the OBJ, and casualty evacuation. With platoon rehearsals complete, the commander receives a final back brief from key leaders and conducts a company rehearsal.

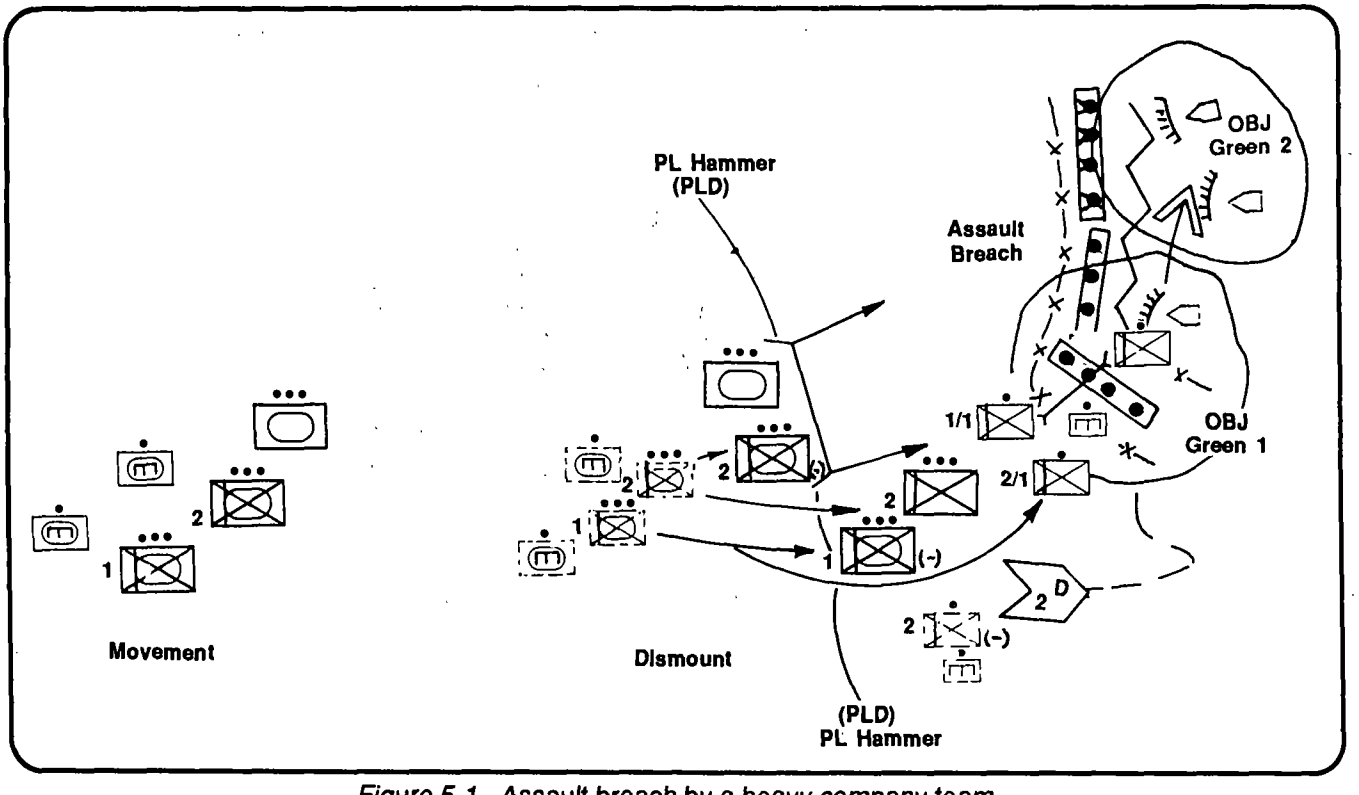


Figure 5-1. Assault breach by a heavy company team.

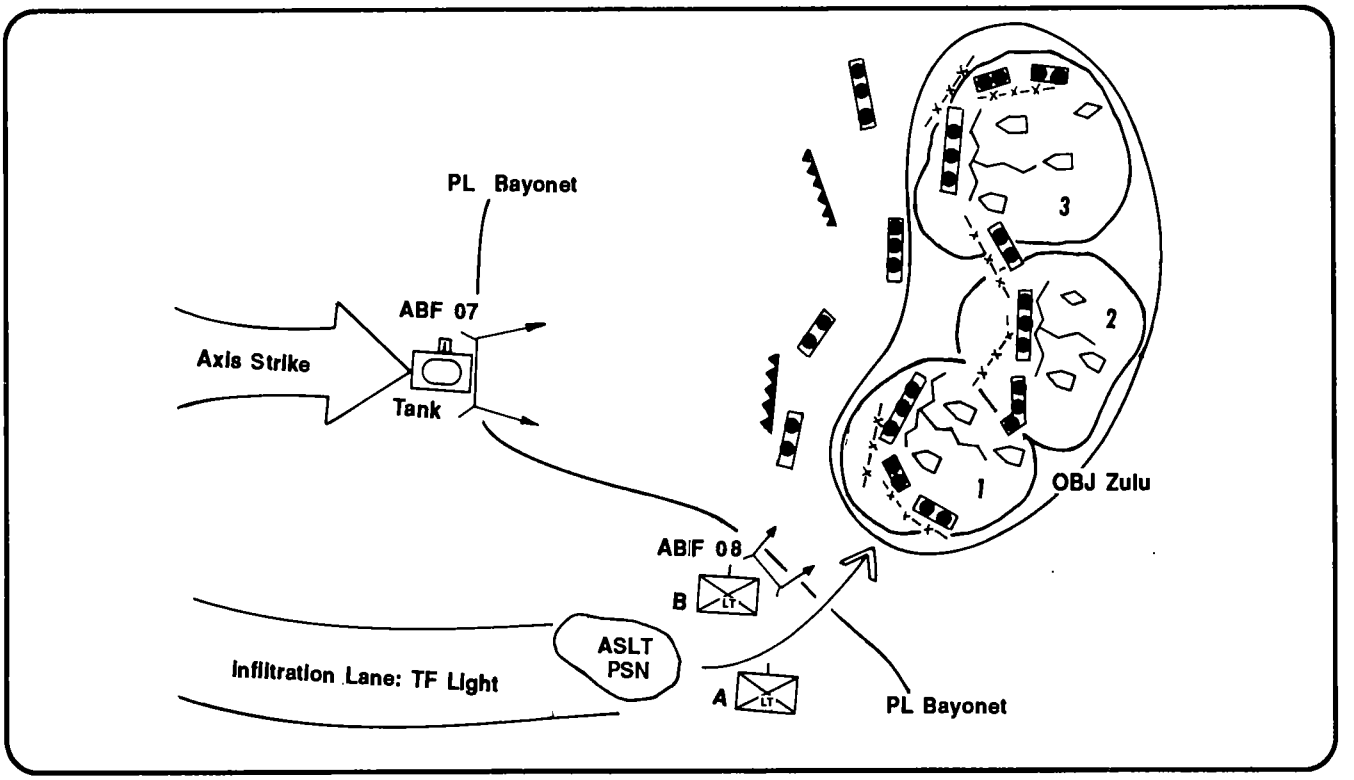


Figure 5-2. Assault breach by a light-heavy task force.

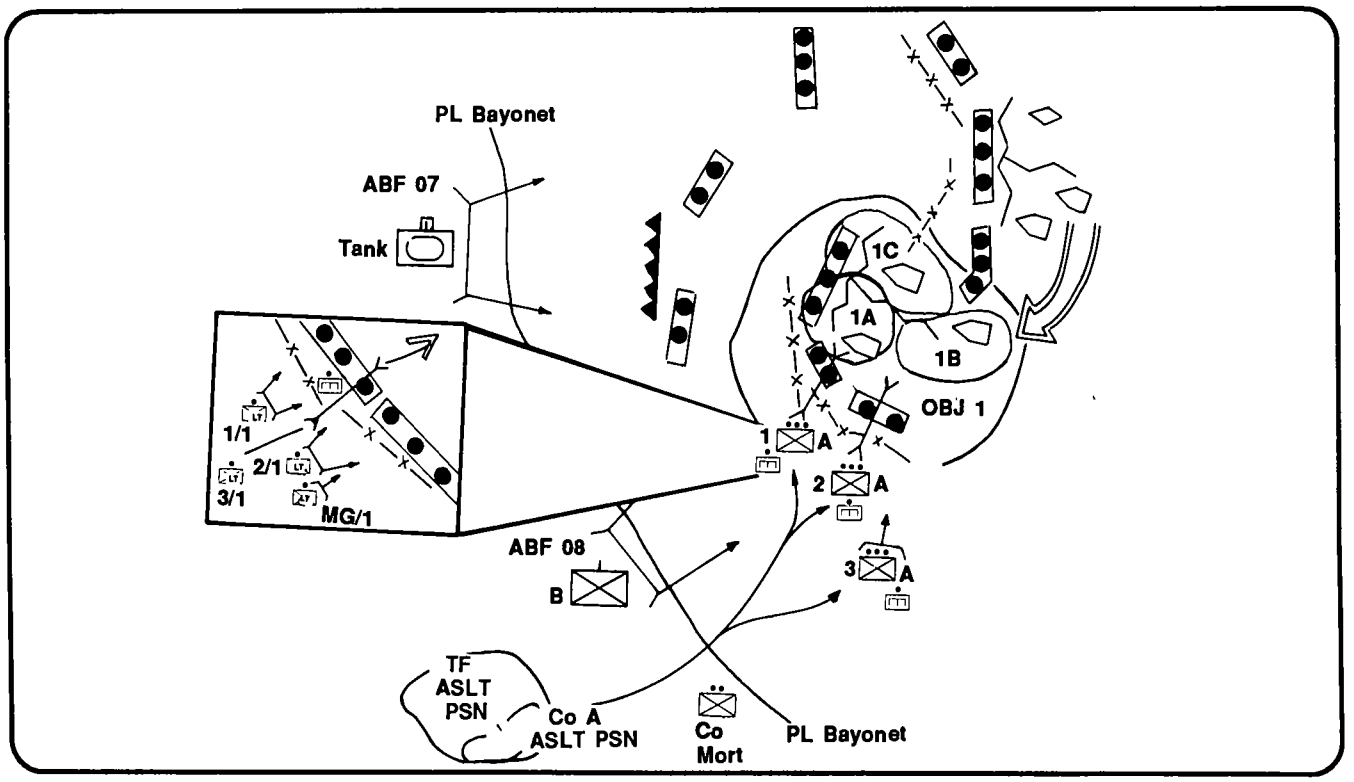


Figure 5-3. Company A's scheme of maneuver and assault breach plan.

Chapter 6
Covert Breach

The success of a light or light-heavy attack depends on the ability of the commander to conserve his combat power for decisive action. He must protect his force from the enemy's fires while he maneuvers them into a position from which he can launch a violent assault. Stealth, surprise, and an assault with overwhelming forces are critical to the maneuver plan. Light and light-heavy breaching operations, therefore, must achieve stealth and surprise. The breach must support the force infiltrating through enemy tactical obstacles and passing dismounted infantry through protective obstacles. The breaching response is the covert breach.

The covert breach is a special breaching operation used by dismounted forces during limited visibility. It is silently executed to achieve surprise and to minimize casualties. The covert breach relies on stealth, quiet manual lane-reduction techniques, and dismounted maneuver. The TF commander plans to conduct a covert breach when his mission specifies infiltration through enemy forward, lightly defended obstacles to attack an objective deeper in the enemy's sector. The commander may also use the covert breach during an assault when the need for surprise outweighs the need for overwhelming suppression. The covert breach may support a mounted attack. In this case, the force conducting a covert breach creates and secures lanes designed for follow-on mechanized forces.

The covert breach applies some characteristics of in-stride, deliberate, and assault breaching operations; however, the planning and execution of SOSR breaching fundamentals are significantly different. Because of these differences, the covert breach is planned as a separate type of breaching operation. Only through distinct separation from the other breaching operations can the covert breach be planned and executed properly.

The breaching tactics and techniques presented thus far have focused on immediate application of overwhelming combat power at the point of enemy resistance over an obstacle. The covert breach, however, takes advantage of surprise to prepare lanes and position support and assault forces without drawing enemy attention. This delays enemy resistance until after lanes are opened and the assault is launched.

The covert breach supports the element of surprise. Breaching the enemy's obstacles without being detected allows the force to bypass enemy resistance or to assault at an unexpected time and place. The covert breach is ideally suited for the light forces. The disadvantage a light force has in combat power is overcome through employing the principle of surprise. Through surprise, the commander conceals his own capabilities and intentions and creates the opportunity to strike the enemy unaware or unprepared.

The commander chooses to conduct a covert breach when—

- Undetected movement is key to infiltrating through enemy tactical obstacles and forward defenses.
- Surprise is essential for breaching enemy protective obstacles and assaulting enemy positions.
- Surprise is essential for breaching enemy tactical obstacles to support a follow-on mounted attack.
- Limited visibility and terrain present the opportunity to silently reduce enemy obstacles.
- Overwhelming combat power is not required to support the breach for an assault.

COVERT BREACHING FUNDAMENTALS

The main difference in the covert breach and other breaching operations is the execution of the SOSR breaching fundamentals. The TF commander task organizes his force to support, breach, and assault the obstacle. In the covert breach, suppression from the support force is a "be prepared" task upon detection of the breach force or "on order" with initiation of the assault. Execution of man-made obscuration is an on-order task that supports the breach force if it is detected. Security is achieved through stealth. Combat forces are positioned to secure the breaching sites by observation. This provides breach, assault, and support forces with early warning of enemy detection. With the need for stealth outweighing the need for speed, the breach force reduces the obstacle.

A force executing a covert breach for a mounted attack must mark, secure, and guard the lanes until the assault. They should be organized into breach, assault, and support forces. The principal mission of the assault force in this case is to move through and guard lanes for the attacking force.

Suppress

Suppression is always planned for the covert breach. Since surprise is essential until the assault, suppressive fires are on-call and only executed when the—

- Lanes are open and the assault is initiated. Supporting fires provide suppression to isolate the assaulted objective.

- Covert breach is discovered in mid-breach. In this situation, suppression must be rapid, violent, and powerful enough to allow the covert breach force to complete the breach or to disengage and change breaching locations.
- Covert breach force completes lane reduction and detonates the charges to clear mines and obstacles in the lanes, signaling direct and indirect suppressive fires for the assault through the obstacle.

Obscure

Obscuration is a necessary condition for covert breaching, whether it is natural or man-made. Covert breaches are best conducted during naturally reduced visibility such as darkness, snowfall, rain, or fog. Under these conditions, thickening the reduced visibility with artificial smoke can cause adequate obscuration without arousing suspicion. This must be done with great care. A sudden application of smoke on a breaching site attracts more attention and enemy fires than an unobscured dismounted breaching attempt. Recurring interdictory artillery fires and smoke on several potential breaching sites can build complacency over a period of days. It trains the enemy to accept the necessary condition of obscuration without abnormal alertness or suspicion of covert breaching attempts. Normally, natural obscuration is used. However, smoke must be planned for and available in case the breaching attempt is discovered.

Secure

Security is provided by a portion of the breach force that is organized into a security team. The function of the security team is to cover the withdrawal of the reduction team if it is discovered. If the obstacle is protected by outposts, the security team may silently eliminate them before the breach is attempted. The security team may also establish ambushes to guard against enemy patrols and engage them at a distance from the breaching effort. Deception can also play a major role in securing a covert breaching effort. If a feint or demonstration attack is launched against another defending unit, it can attract attention away from a covert breach. Securing the passage of the force is accomplished by guarding the lanes once they have been completed. This can be done by a large security force on the enemy side of the obstacle, but it generally consists of establishing a well-hidden observation post (OP) to watch the lane until the attack. The OP provides warning if the enemy discovers the lane.

Reduce

The obstacle is reduced by using silent techniques such as—

- Marking mines.
- Cutting wire.
- Cutting down the sides of an AT ditch with shovels.
- Setting explosive charges and waiting to detonate them at a predetermined signal.

The size and organization of the breach force depends on the maneuver mission the covert breach supports. For the covert breach supporting an infiltration, engineer support is often decentralized to support the infiltrating elements. If a covert breach supports the assault on a defensive position, engineers are consolidated under centralized control to reduce protective obstacles. Because surprise and undetected movement are critical, only the breach force consisting of breach and security elements are forward at the obstacle. The assault force is held back until the lanes are open. Once lanes are open, the breach force guides the assault force through.

The commander must be prepared to transition to an assault breach if the covert breach is detected. Assault platoons would then move forward to the breaching site and control transitions to decentralized execution, as in an assault breach.

The need to maintain silence during the breach increases the difficulty and the time required. The breach force must plan to begin reducing obstacles early enough to accomplish the breach in time for the assault and must also plan for the additional equipment required to execute a quicker, alternate breach in case the covert breach fails.

The number and width of lanes depends on the composition of the assault force that will pass through the obstacle. A minimum of one lane is required for each dismounted assault platoon. If the covert breach supports a mounted attack, then two lanes per passing TF are required. It is important to have a carefully arranged lane-marking and reporting system. The work of the covert breach force must be accurately conveyed to follow-on units.

TASK FORCE COVERT BREACH

The TF is the principal unit to conduct a covert breach. The covert breach requires a level of detailed planning, intelligence collection, and command and control that is beyond the capability of a company. On the other hand, a brigade is simply too large to maintain the level of stealth necessary to conduct a covert breach. The TF combines the detailed planning afforded by a well-trained combined arms staff, the command and control of a seasoned commander, and flexibility of the company team.

Planning

The TF commander will organize his lead company to conduct a covert breach during the infiltration to quickly overcome unexpected or lightly defended obstacles that cannot be bypassed. The TF commander will allocate the necessary resources to the lead infiltrating company. The

company commander is then responsible for synchronizing the SOSR breaching fundamentals applied to the covert breach. The TF commander uses the characteristics of an in-stride breach to organize for the covert breach.

The force planning the covert breach must analyze the METT-T conditions to determine when a covert breach is practical. The mission must allow sufficient time for deliberate planning, preparation, and reconnaissance. Limited visibility provides the optimum conditions for execution of a covert breach. Terrain must provide concealment for movement to the breaching sites.

Reconnaissance, as in any attack, is key to the covert breaching operation. Reconnaissance must confirm the plan to move undetected to breaching locations, select the most favorable breach and assault locations, confirm the support force location, and complete all requirements undetected.

Preparing

Preparation for a covert breach involves the same procedures as other breaching operations. It becomes more critical in a covert breach, since synchronization of SOSR breaching fundamentals can be based on a primary and/or a contingency plan.

Preparation in the assembly area for covert breaching should include practice to hone platoon battle drills as well as company team and TF breaching actions. The unit preparing to conduct a covert breach rehearses against the expected obstacles in similar terrain and conditions. Rehearsals include all key leaders of the combined arms team. The rehearsal includes the following plans: covert reduction undetected, actions to be taken if covert reduction is detected in midbreach (especially fire control measures), and possible transition to assault breach.

In the assembly area, the force distributes and prepares breach-specific equipment: wire cutters, cloth to muffle the sound of wire being cut, probes, mine markers, lane marking material, and backup breaching equipment for a failed covert breach. They review SOP items such as lane marking, signals, and code words to ensure that all personnel are familiar with them. The PCI is a critical event during preparation. The commander uses the inspection to ensure that subordinates know the plan and what to do if they are detected. The commander looks at broken equipment and removes or ties down any equipment that creates noise. This prevents detection of the breach, support, and assault force activities at the obstacle.

TASK FORCE COVERT BREACH SCENARIO

The TF commander receives the mission from the brigade to conduct a passage of lines and infiltrate to destroy an MRC (minus) defending OBJ Red. The TF must seize OBJ Red under the cover of darkness and be able to pass TF Mech through to the brigade OBJ. The enemy's first echelon is less than 50-percent strength and constitutes the limited forward hasty defense. Based on the situation template, the commander expects only a COP with supporting tactical obstacles along his infiltration lane. The infiltration lane offers restricted terrain up to OBJ Red. OBJ Red is a choke point defended by an MRC (minus) continuing to prepare its positions. The commander has 36 hours to conduct planning and reconnaissance before the attack.

The TF commander sends his scouts and combat patrols out on reconnaissance missions that evening. The scouts infiltrate into OBJ Red and report that MRC (minus) has emplaced extensive protective obstacles around its position. The scouts also reconnoiter the infiltration lanes and report that all lanes provide excellent concealment into OBJ Red.

The commander develops a plan that is designed to achieve surprise. The cover of darkness and restricted terrain enable the force to infiltrate into support and assault positions to attack a flank of OBJ Red. In order to maintain the surprise of the attack, the commander must use a covert breach against the enemy's protective obstacles. The commander masses his engineers in the breach force. The breach force must also have infantry to establish security around the breaching site while engineers execute silent breaches in the wire and AP minefields. The support and assault forces are prepared to execute their missions if the breach is detected. Once the lanes are open, the assault force moves through the lanes and assaults the OBJ Red. Simultaneously, the support force opens fire to support the assault (see *Figure 6-1, page 6-4*).

The light TF begins its attack by conducting a passage of lines and infiltration. Companies A and B are in the south, and Company C (minus) is in the north. The scouts locate bypasses of the COP obstacles and position themselves in both the north and south. Companies A and C (minus) are prepared to conduct a covert breach of unexpected obstacles or of the COP obstacles, if required during the infiltration. The commander attaches the engineer platoon (minus) to Company A (initially the main effort) for the covert breach of OBJ 1 and the assault to secure OBJ 1. The commander attaches one engineer squad to Company B. Company C (minus), the support force, has no engineer support and organizes its elements into support, breach, and assault forces for the infiltration.

The brigade has been conducting interdictory fires, smoke, and illumination the previous two nights and continues these fires during the TF infiltration. Company C (minus) occupies the ABF position as Companies A and B move into the assault position. Interdictory fires lift as Company A moves forward out of the assault position to begin the breach. Because the interdictory fires have been sporadic, lifting and shifting to surrounding positions do not create enemy suspicion.

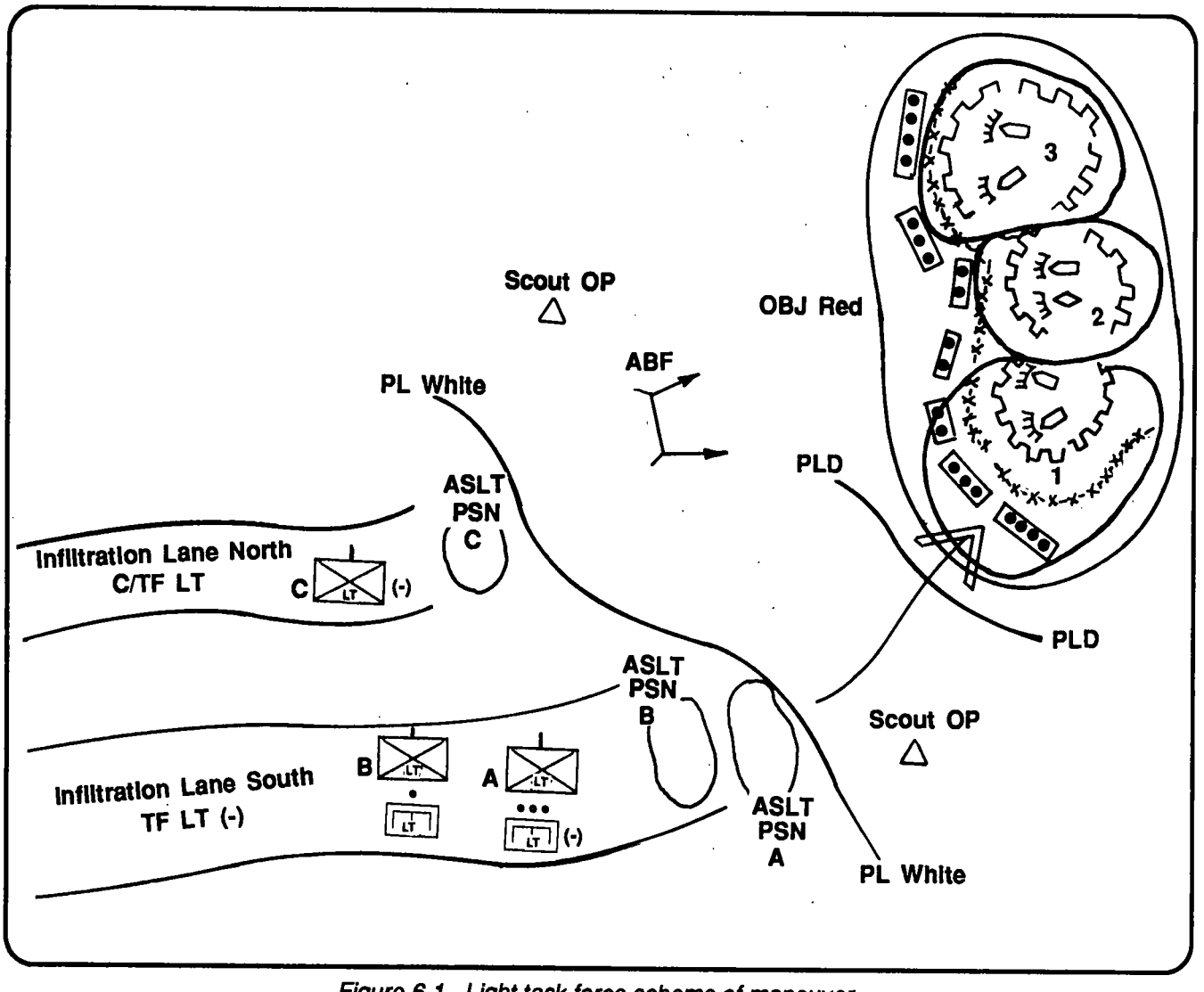


Figure 6-1. Light task force scheme of maneuver.

Company A moves out of the assault position to the selected breaching location (see *Figure 6-2*). Company A organizes its forces into a breach and security force consisting of two engineer squads and an infantry platoon and an assault force of two infantry platoons. The breach force reduces the protective obstacles in two locations separated by 50 meters. The engineers probe a path through the minefield and cut the wire. They position bangalore torpedoes short of the breaching sites as a contingency for a failed covert breach. Company C (minus) is prepared to execute direct and indirect fires and smoke on OBJs 2 and 3 to isolate OBJ 1 if the covert breach is detected. The assault on OBJ 1 initiates direct and indirect fires and smoke on OBJs 2 and 3 from Company C (minus). After Company A secures OBJ 1, support fires lift and Company B passes through Company A to seize OBJs 2 and 3.

One engineer squad remains at OBJ 1 breaching sites to guide Company B through. The other engineer squad assaults with Company A to provide engineer support on the OBJ. Company B's engineer squad provides assault breach and demolition support on OBJs 2 and 3.

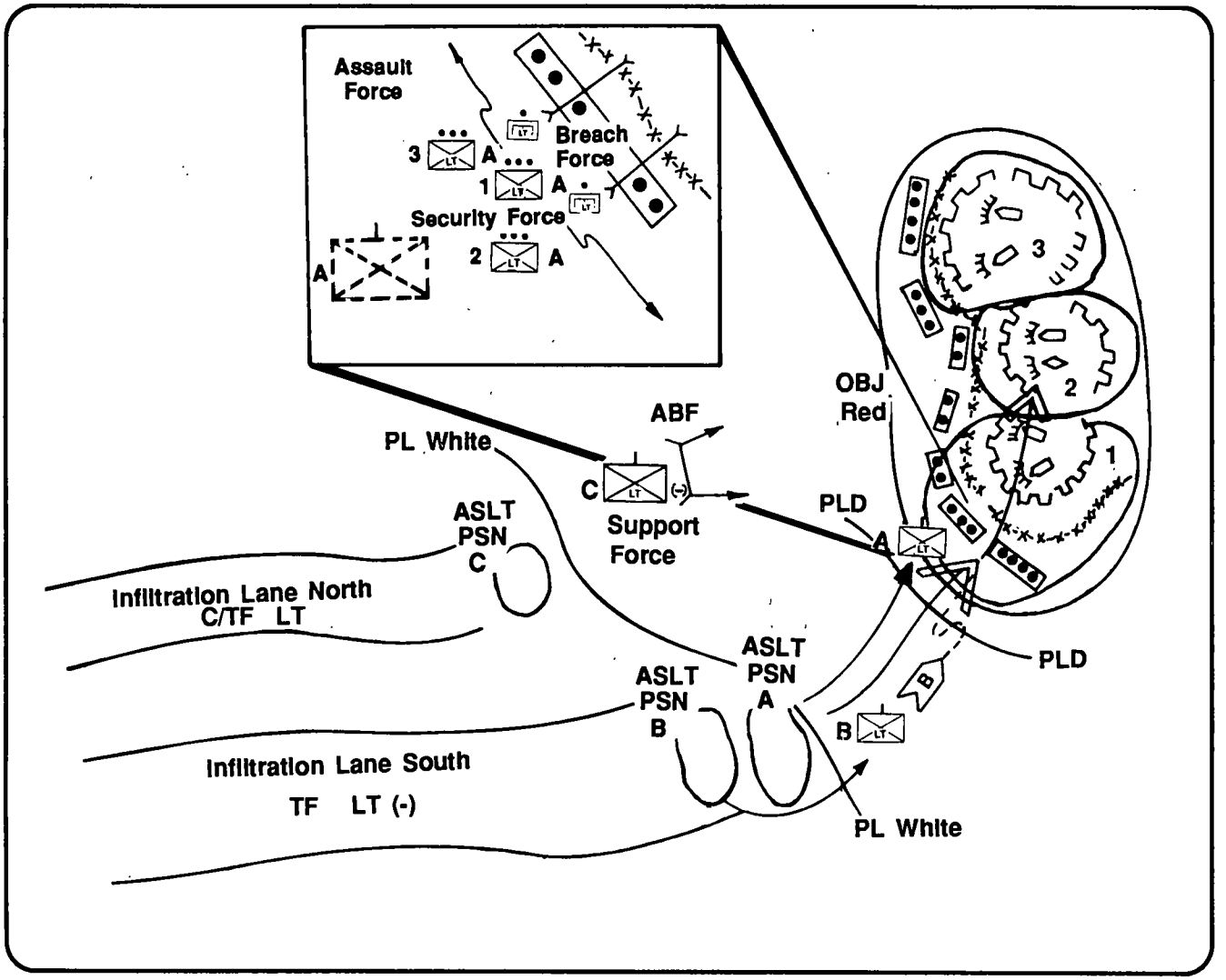


Figure 6-2. Light task force covert breach execution.

Chapter 7
Breach Training

Breaching operations are a common task on the mission-essential task list (METL) of most battalion TFs and brigades. Conditions vary with the type of breaching operation: in-stride, deliberate, assault, or covert. The standard is to synchronize the support, breach, and assault forces; successfully execute the breach; and pass the force to continue the mission. Force commanders must assess the proficiency of their units and train them to perform breaching operations to this standard.

ASSESSING UNIT NEEDS

Leaders assess the ability of their units to conduct combined arms breaching operations proficiency through evaluations (informal, formal, internal, and external) (*FM 25-100*). The assessment is not based solely on the results of the last field training exercise (FTX). The leader must look at all the available information that impacts on the unit's ability to conduct breaching operations. Critical sources for unit training proficiency are—

- Skill qualification test (SQT) results.
- Personnel turnover.
- Common task test (CTT) results.
- New equipment training (NET).
- Gunnery and weapon qualification results.
- Training briefings.
- Previous after-action reports.

A breaching operation is a true combined arms task and must be trained as such. Leaders must consider the breach training proficiency of their supporting units as well as their own unit. A unit is only as strong as its weakest link. A change in the normal association of combat support units with the maneuver battalion or brigade affects the training proficiency of the total combined arms force. The force commander must keep current on the training status of his engineer, air defense, and field artillery officers that support his force. With the completion of a breach training assessment, the force commander incorporates breaching operations training (prioritized in relation to other METL tasks) in his long-range, short-range, and near-term planning calendars.

INTEGRATING BREACH TRAINING

In long-range planning, the force commander establishes priority for proficiency in breaching operations. He outlines force training guidance, combined arms training, major training events, training area densities, and individual training goals for at least a year. During long-range planning, the commander determines the priority that breaching operations will receive as a METL task. Unit leaders then determine unit, leader, and individual training needed to meet the standard for breaching proficiency. The commander determines when and how often the force will train with all the necessary combined arms assets in order to conduct breaching operations to standard. He chooses training area densities and events during which the force will practice breaching operations. Finally, he evaluates the force in breaching operations and applies assessments to short-range and near-term training guidance.

FM 25-100 outlines the Green, Amber, and Red training-management cycle derived from the commander's long-range training plan. During cycles, units focus on collective-task training, usually coinciding with major training events and training area densities. Soldier absences and distractions are minimized. This is usually the first time the commander has the opportunity to train all aspects of the deliberate and in-stride breach. During Amber cycles, units emphasize small-unit, crew, and individual training, although some subunits will be able to conduct collective training. The commander may be able to use the Amber cycle to focus on the small-unit collective tasks required to conduct an in-stride breach, such as a company team's actions at obstacles. In Red cycles, however, training opportunities are constrained by soldier absences and administrative requirements, and subunits focus on individual, leader, and crew training. The leader uses the Red cycle to focus on breach planning as part of command post exercises (CPXs) and on the individual skills required to reduce obstacles.

The Green, Amber, and Red training-management cycle reinforces a logical progression of individual, crew, leader, subunit-collective and force-collective training (see *Table 7-1, page 7-2*). As with any training, the unit must first train individuals, crews, and smaller units to standard on critical subtasks of combined arms breaching. With a solid foundation at the individual, crew, and small-unit level, company teams and TFs can successfully progress to training the more complex collective breaching tasks.

USING MISSION TRAINING PLANS (MTPs)

The commander begins planning breach training by establishing an operations outline as explained in Army Training and Evaluation Program *(ARTEP) 71-2-MTP, Chapter 3.*

Table 7-1. Integrating breach training into the training cycle.

Month 1 Green	Month 2 Amber	Month 3 Red	Month 4 Green	Month 5 Amber	Month 6 Red
Evaluate unit's breach proficiency during prime training.	Train squad and platoon breach tasks based on evaluation.	Train individual breach tasks. Conduct company team leader breach chalk-talks and sand-table exercises on task force in-stride and assault breaches.	Evaluate task force's in-stride breach and company team's assault breach using company level situational training exercises.	Train squad and platoon collective tasks based on Green period.	Train individual skills based on Green period. Leader training focuses on deliberate and covert breaches.

Month 7 Green	Month 8 Amber	Month 9 Red	Month 10 Green	Month 11 Amber	Month 12 Red
Train and evaluate company team support, breach, and assault collective tasks for deliberate and covert breaches.	Train squad and platoon tasks based on last Green period.	Train individual skills based on Green period. Leader training focuses on synchronizing deliberate and covert breaches.	Train and evaluate task force deliberate and covert breaches using task force situational training exercises.	Train squad, platoon, and company-team-level collective tasks based on last Green period.	Train on individual skills based on Green period. Leader training on company team breaching for task force in-stride and company team assaults.

The operations outline illustrates critical TF, company team, and separate platoon tasks for a given operation. *Table 7-2* shows that breaching an obstacle is a critical task at both TF and company-team level for offensive operations. For the in-stride breach, the training emphasis is at company team level, while performance at TF level becomes more critical for the deliberate breach. The task, conditions, and standards for the TF-level task, Breach Defended Obstacles, are shown in *Table 7-3, page 7-4*. These become the basis for training the TF deliberate breach.

The complexities of the deliberate breach demand that the commander develop a training plan designed to train diverse, multiechelon tasks. The commander develops an operations outline using the tasks outlined in MTPs for TFs through platoons. Critical tasks and supporting battle tasks normally associated with conducting a TF deliberate breach are depicted in *Table 7-4, page 7-5*).

The commander develops an operations outline specifically for the deliberate breach using the list of critical collective breach tasks developed earlier. The operations outline maps the critical collective tasks that must be performed at TF, company, and special platoon level as part of a deliberate breach. The deliberate breach requires subordinate units to perform specific support, breach, or assault functions. Therefore, the commander further subdivides company-level critical collective tasks into those performed by the support, breach, and assault forces (see *Table 7-5, page 7-6*). Engineer company and platoon tasks are mapped separately, since their roles in the deliberate breach are quite different from those of their maneuver counterparts.

The operations outline becomes the focus for developing progressive collective training goals. The outline illustrates for the TF commander the company collective tasks that must be trained before training on a deliberate breach operation. Likewise, the outline is a tool for company team commanders to use for developing their own collective training strategy.

The operations outline is also used by the commander as the basis for evaluating his unit's proficiency in a critical collective task or subtask. For example, a TF commander wanting to evaluate a company's ability to be the support force might evaluate the following tasks: Support by Fire; Employ Indirect Fire in the Offense; or Perform Actions on Contact. Each collective task is supported by a training and

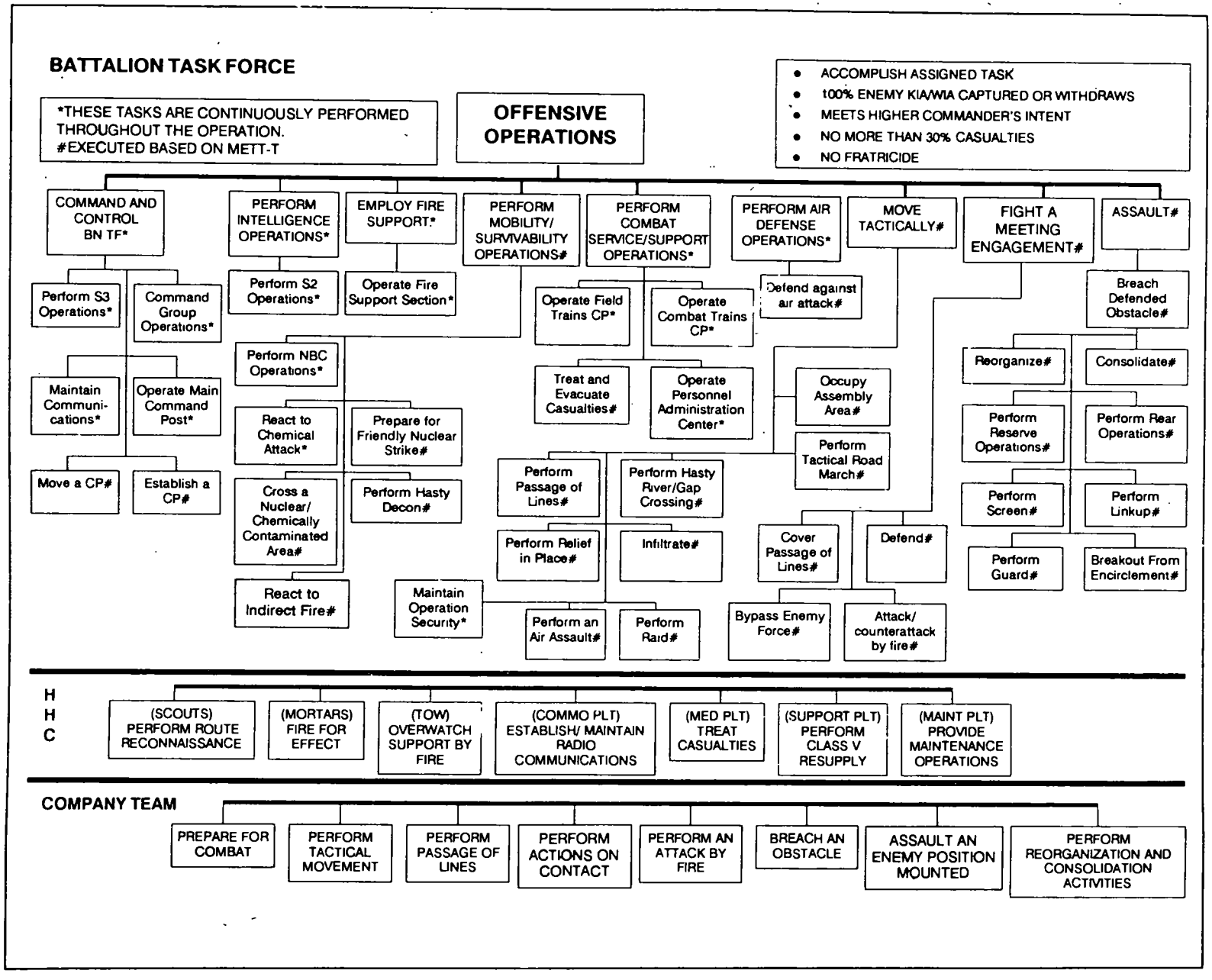


Table 7-2. Task force offensive operations outline.

Table 7-3. Task, conditions, and standards of a task force deliberate breach.

Task: Breach Defended Obstacles

Conditions: The task force is ordered to breach a defended obstacle system to initiate the brigade's penetration on an enemy position. The area of the breach is covered by an MRC. Supporting attacks fix and suppress adjacent MRCs. The terrain does not permit bypass or wide envelopment. The obstacle system has wire obstacles, antitank and antipersonnel mines, and an antitank ditch. The task force has priority of fires and has a company of engineers attached.

Standards:

a. The task force completes the initial breach within 45 minutes.
b. The task force sustains no more than 30 percent casualties or combat vehicle losses.
c. The task force moves the follow-on task forces through the obstacle system without losses due to friendly fire or obstacles, not later than the time specified in the brigade order.
d. The task force sustains no casualties or vehicle losses due to friendly fire.

evaluation outline (T&EO) in the unit's MTP. *Table 7-6, pages 7-7 and 7-8*, is an example of a T&EO for the breach force task (Task #7-1-3027, Breach Defended Obstacles).

Finally, the company team commanders use the critical collective subtasks to form the foundation for their unit's individual training. The commander selects critical subtasks his unit needs to train on based on his evaluation. He then uses the collective-to-individual task matrix to identify individual skills that require training. An example of a cross-referencing matrix is shown at *Table 7-7, page 7-9*. The figure illustrates only one page of the cross-reference collective-to-individual task matrix from *ARTEP 7-8-MTP*. As part of the overall breach training plan, subunit leaders (especially noncommissioned officers (NCOs)) continuously assess the proficiency of soldiers in these enabling tasks. This feedback is incorporated in short-range and near-term training plans and is particularly important in developing plans for Red training periods.

TRAINING THE TYPES OF BREACHES

The commander develops a training strategy for the in-stride, assault, and covert breaches by using the same steps described above. In most cases, the critical collective tasks, subtasks, and individual skills are the same. However, the nature of the in-stride breach requires more training emphasis at the subordinate level. A TF in-stride breach, for instance, requires emphasis at the company team level. The company team commander must be able to apply and synchronize the SOSR breaching fundamentals using platoons in the support, assault, and breach roles. Training the in-stride breach, therefore, demands that the company team commander develop training plans that hone the skills outlined in *Table 7-4*. Likewise, the assault breach focuses on platoon and squad actions and is trained accordingly. Training for the covert breach is similar to the deliberate breach; however, the conditions under which the breach is trained must emphasize limited visibility, and the standards are modified to stress achieving surprise.

CONDUCTING TRAINING EXERCISES

The force commander and his staff plan, conduct, and evaluate training exercises to integrate collective and individual skills required for breaching operations. Training management requires a logical progression from individual, crew, and squad training through subunit collective training to TF training. Leader training must be integrated continuously to ensure proficiency in tracking the breach and making breaching decisions. Good training management requires that the TF conduct preliminary training before conducting a full-up exercise. Effective preliminary training ensures that the force will accomplish the task to a wartime standard under wartime conditions during a full-up exercise. The force conducts chalk-talks, map exercises, tactical exercises without troops (TEWT), and situational training exercises (STXs) to establish a breach training foundation.

The force commander conducts chalk-talks with leaders of all subordinate company teams, platoons, squads, and attached or supporting elements. For example, the commander leads his unit subordinates through an in-stride breach, discussing his role in planning and preparation and letting his subordinates discuss execution. The commander assesses the proficiency of his subordinates while they share breaching knowledge with each other. The chalk-talk is an excellent tool to firmly establish the doctrinal concepts, time sequence, coordination, and decision requirements of the operation. It allows all unit leaders to see and understand the operation's "big picture."

Table 7-4. Critical collective tasks in breaching operations.

Unit	Task	Task Number
Battalion Task Force	Command and Control BN/TF	7-1-3901
	Perform Intelligence Operations	7-1-3905
	Move Tactically	7-1-3004
	Perform Hasty Gap Crossing	7-1-3005
	Attack by Fire	7-1-3007
	Employ Fire Support	7-1-3907
	React to Indirect Fire	7-1-3034
	Breach Defended Obstacle	7-1-3027
	Defend Against Air Attack	7-1-3037
	Assault	7-1-3007
	Treat and Evacuate Casualties	7-1-3033
Company Team Level	Prepare for Combat	17-2-0101
	Perform Reconnaissance	17-2-0202
	Perform Tactical Movement	17-2-0301
	Perform Assault Position Activities	17-2-0328
	Perform Actions on Contact	17-2-0304
	Attack (Support) by Fire	17-2-0306
	Employ Indirect Fire in Offense	17-2-0401
	Breach an Obstacle	17-2-0501
	Defend Against Air Attack (Active)	44-2-6002
	Assault an Enemy Position (Dismounted)	17-2-0310
	Assault an Enemy Position (Mounted)	17-2-0326
	Provide Medical Evacuation and Treatment of Casualties	17-2-0705
Mechanized Infantry Platoon	Move Tactically	7-3-1025
	Attack (Support) by Fire	7-3-1007
	Cross Danger Area	7-3/4-1028
	React to Indirect Fire	7-3/4-4023
	Breach an Obstacle	7-3-1014
	Assault	7-3/4-1011
	Assault Mounted	7-3-1013
Tank Platoon	Perform Platoon Fire and Movement	17-3-0217
	Perform Attack by Fire	17-3-0219
	Assault an Enemy Position	17-3-0220
	Take Actions at Obstacles	17-3-0401
	Employ Mine Plow, Roller, and Clams	17-3-XXXX
Engineer Company	Plan and Direct Engineer Reconnaissance	05-2-0410
	Control Combat Formations	05-2-1212
	Conduct Breaching Operations	05-2-0114
	Prepare Expedient Fords	05-3-0603
	Employ the AVLB	05-4-0009
	Employ the CEV	05-5-0011
	Take Active Air Defense Against Hostile Aircraft	05-2-1039
Engineer Platoon	Conduct Troop Leading Procedures	05-3-1018
	Conduct Enemy Obstacle Reconnaissance	05-4-0411
	Move Mounted	05-3-1229
	Move Dismounted	05-3-1230
	Change Formations (Mounted)	05-3-1231
	Conduct Fire and Movement	05-3-1220
	React to Contact	05-3-1202
	React to Indirect Fire	05-3-1231
	Breach Obstacles	05-3-0043
	Conduct Breach of a Minefield	05-3-0103
	Improve a Vehicle Lane Through a Minefield	05-4-0105
	Evacuate Casualties	05-3-1006

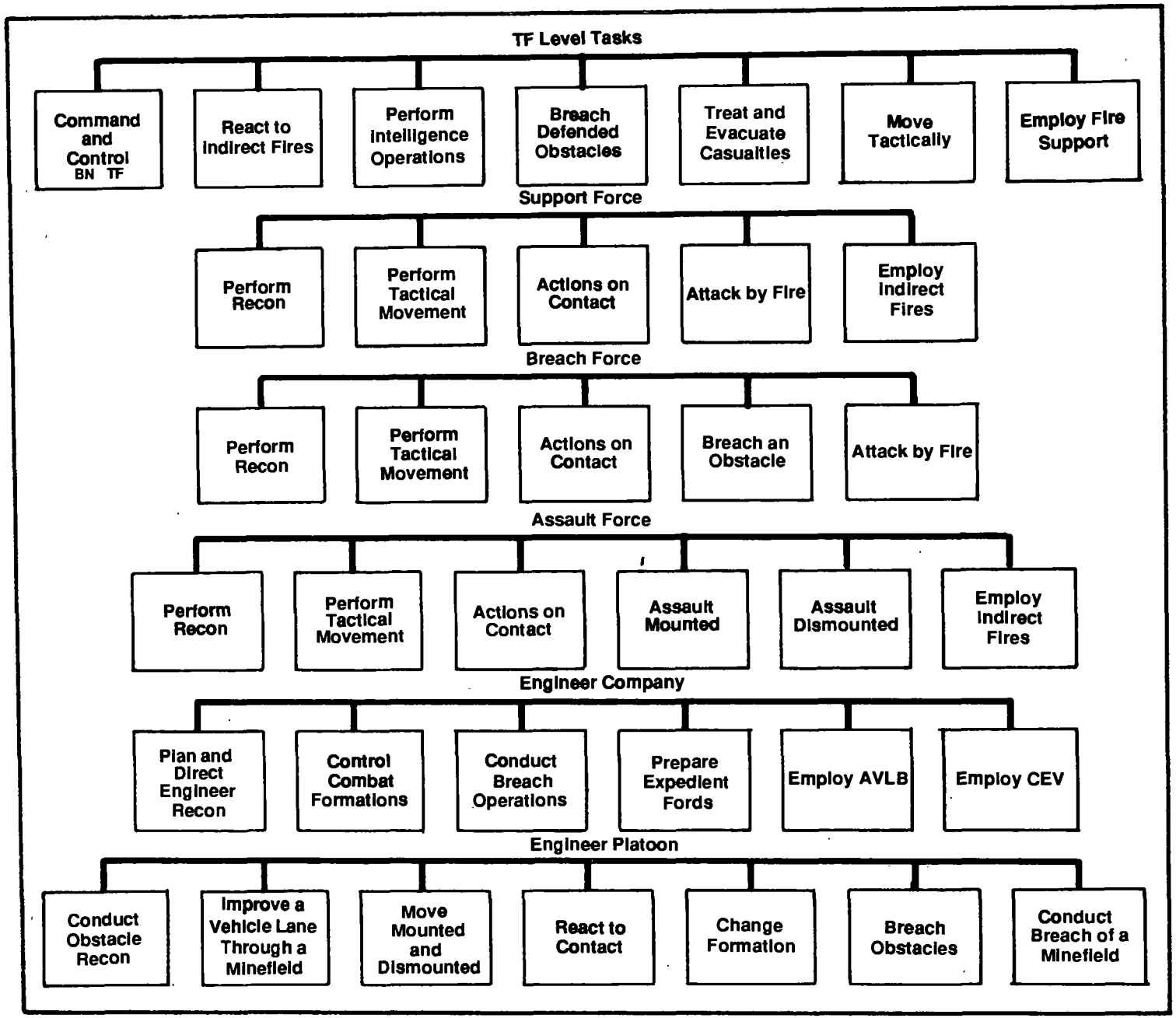


Table 7-5. Task force deliberate breach operations outline.

Table 7-6. T&EO for task Breach Defended Obstacles.

ELEMENT: BATTALION TASK FORCE **

TASK: BREACH defended obstacles (7-1-3027) (FM 71-2)

ITERATION 1 2 3 4 5 (circle)

TRAINING STATUS T P U (circle)

CONDITION: The TF is ordered to breach a defended obstacle system to initiate the brigade's penetration of an enemy defensive position. The area of the breach is covered by an MRC. Supporting attacks fix, but do not suppress, adjacent MRCs. The terrain does not permit bypass or wide envelopment. The obstacle system has wire obstacles, antitank and antipersonnel mines, and an antitank ditch. The TF has priority of fires and may have a company of combat engineers attached.

TASK STANDARD:

a. The TF completes the initial breach within 45 minutes.

b. The TF sustains no more than 30 percent casualties or combat vehicle losses.

c. The TF moves the following TFs through the obstacle system without losses due to friendly fire or obstacles, NLT the time specified in the brigade order.

d. The TF sustains no casualties or vehicle losses due to friendly fire.

SUBTASKS AND STANDARDS:	GO	NO-GO
+1. TF performs reconnaissance of the obstacle system.		
a. Leader reconnaissance takes place down to squad/crew level.		
b. TF locates all reinforcing and existing obstacles.		
c. TF locates vehicle positions, antiarmor weapons, and platoon positions covering the obstacles.		
d. TF determines the width, depth, and composition of the obstacle system.		
e. TF locates overwatch/support-by-fire positions to support the breach, covered and concealed routes to these positions, tentative initial breach points, and covered and concealed routes to the initial breach points.		
f. Reconnaissance does not disclose the time, location, or plan for the breach.		
g. Reconnaissance provides early warning of changes in the obstacle system through continuous surveillance of the obstacle system and supporting positions.		
***+2. TF commander and staff plan breach.**		
a. Subordinate unit tasks are assigned to fix the enemy and to prevent shifting forces to defeat the breach effort.		
b. ADA covers the breach and passage of units through the obstacles.		
c. Engineers, if attached, are task organized with the breach element.		
d. Indirect fires, CAS and fire control measures are planned and coordinated with the S2's template to suppress enemy weapons and positions that overwatch the breach site and to obscure the enemy positions and weapons, the breach site, and the terrain between the breach and enemy positions.		
e. Plan specifies the method of breach.		
f. Staff coordinates for the equipment needed to breach or reduce the obstacle.		
g. Plan includes a breach and support force with tasks for each.		
h. Plan is coordinated with adjacent and follow-on units.		
+3. TF prepares for the breach.		
a. Preparation actions are directed and coordinated; routes are marked, and support-by-fire/overwatch positions are established.		
b. Preparations do not disclose the breach plan, time, or location.		
c. TF reorganizes into the breach element and support element.		
+4. Support force moves to an overwatch position.		
a. Positions are occupied that cover likely enemy positions.		
b. Support force uses available cover and concealment during movement.		
c. Each support element can locate where the breach will be made and where the breach element is moving from.		
d. Fire control measures (targets, limits of fire, TRPs, and so on) are designated to each support element on the ground once they are in position.		
e. All-round security is maintained. The overwatch element is not surprised by the enemy.		
+5. Support force provides overwatch for the breach force.		
a. Requests smoke on the far side of the obstacle and on known enemy positions.		
b. Fires on suspected and known enemy locations with direct fires, preventing the enemy from fixing or stopping the breach element. Warns the breach element before the enemy can assault.		
c. Uses smoke to obscure area around the obstacle.		
+6. Breach force establishes breach site security.		
a. Moves to the breach point(s) using available cover and concealment.		

+ Critical task
*** Leader task**
**** From *ARTEP 71-2-MTP, October 1988***

Table 7-6. T&EO for task Breach Defended Obstacles (continued).

SUBTASKS AND STANDARDS:	GO	NO-GO
b. Secures near side of the obstacle by clearing all enemy on the near side, and booby traps and mines on the approaches.		
c. Establishes and operates OPs and prevents the enemy from assaulting the main breach force without warning.		
+7. TF performs the breach/initial penetration.		
a. Enemy obstacles are breached, or bypass routes are found and marked. These routes provide for rapid protection passage of the assault element.		
b. At least one route is cleared of all mines and is clearly marked IAW unit SOP. This route is wide enough for the passage of the assault element.		
c. Breaching element loses no more than 50 percent of combat equipment and personnel.		
d. Breaching force clears all enemy infantry defending the obstacle.		
e. The obstacle is breached (demolitions, mechanical, vehicle, or manual). (Companies breach lanes IAW ARTEP 71-1, T&EO 17-2-0501, Breach an Obstacle).		
f. All remaining mines in the initial breach are marked IAW unit SOP.		
g. Foot lanes are initially established if a mounted assault is not practical.		
+8. Bresch element completes the bresch.		
a. Secures the far side of the obstacle to prevent the enemy from counterattacking the TF main body without warning.		
b. On order, support element moves through the obstacle and clears the far side of enemy, which can prevent the assault element from moving through lanes.		
+9. Assault element moves through the obstacle.		
a. Tanks lead through if antiarmor defenses are not effective.		
b. Infantry leads if antiarmor defenses are effective.		
c. Assault element destroys or forces the withdrawal of enemy forces and weapons that can place direct fire on the breach point(s).		
+10. TF improves the bresch.		
a. All breach sites are widened to permit at least one vehicle to pass.		
b. All mines are removed, destroyed, or marked in the widened lanes IAW unit SOP.		
c. All physical obstacles (cribs, tank ditches, and so on) are reduced so that combat vehicles can move through the lane.		

SUBTASKS AND STANDARDS:	GO	NO-GO
d. Entrance, exit, and boundaries of the lanes are marked IAW unit SOP.		
+11. TF passes following units through the obstacle system.		
a. TF notifies following units and brigade main CP when the breach is passable to following units.		
b. TF warns passing units before the enemy can counterattack with ground elements.		
c. Guides direct movement into cleared lanes, prevent congestion or halts in movement, and redirect traffic to alternate lanes if a lane becomes blocked or taken under effective antiarmor fire.		
d. TF maintains local security and overwatch, and prevents direct fire on passing units.		
e. Passing unit loses no vehicles or personnel to enemy mines or TF fire.		

TASK PERFORMANCE SUMMARY BLOCK						
ITERATION	1	2	3	4	5	TOTAL
Total subtasks and standards evaluated						
Total subtasks and standards "GO"						

OPFOR TASKS and STANDARDS:

TASK: Defend obstacle

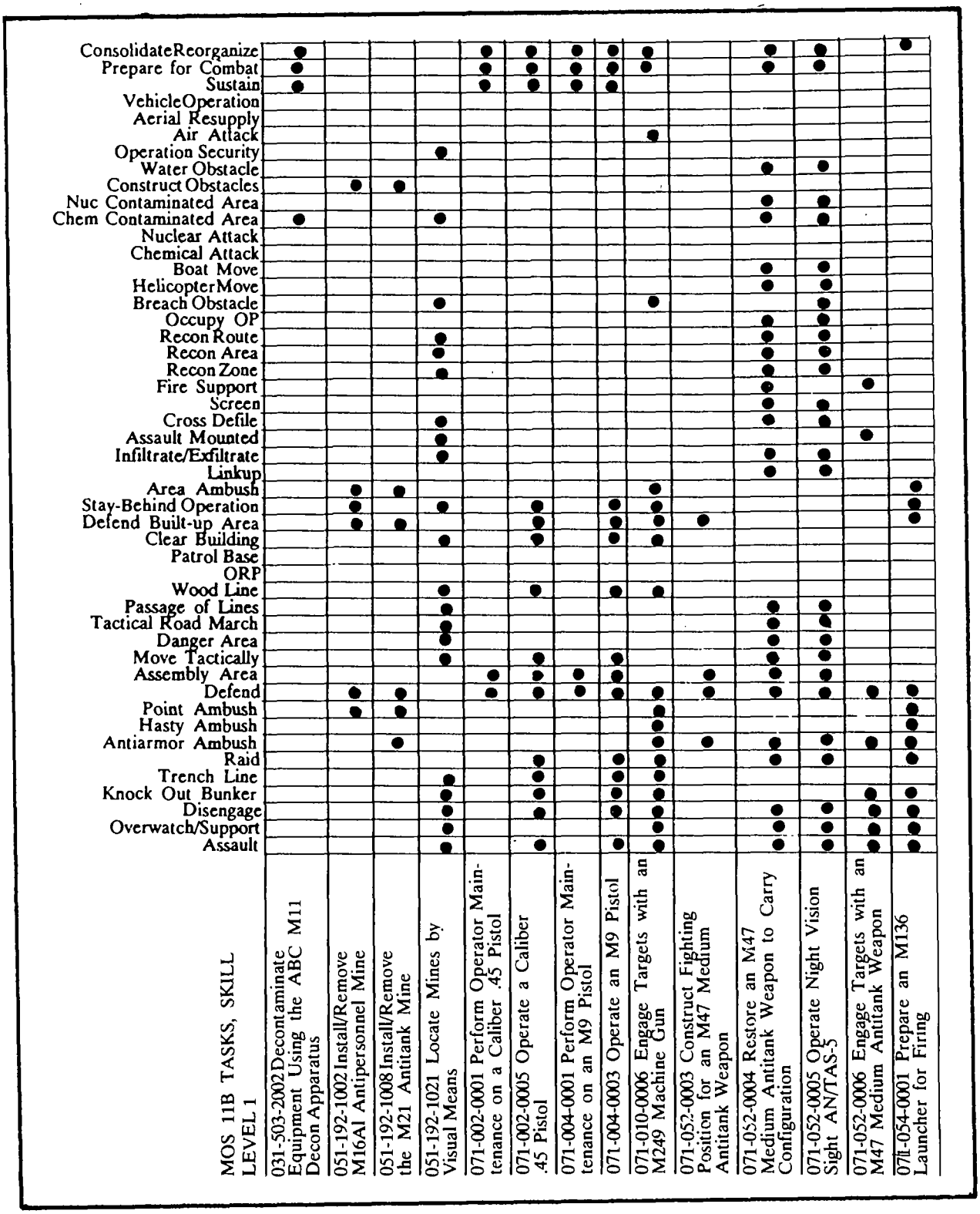
CONDITION: The MRC(+) is in an established defense IAW FM 100-2-1.

STANDARDS:

1. The OPFOR prevents the TF from detecting the obstacle.
2. The OPFOR prevents the TF from moving the following units through the breach.
3. The OPFOR inflicts more than 30 percent casualties or vehicle losses on the TF.
4. The OPFOR delays the initial breach for more than 45 minutes.

+ Critical task
*** Leader task**
**** From *ARTEP 71-2-MTP, October 1988***

Table 7-7. Collective-to-Individual task matrix extract.



The commander executes a map exercise with the same participants and expands training, to include consideration of specific terrain, obstacles, and spatial relationships between elements. Force leaders represent their units with symbols or figures and war-game the breaching operation, considering different possibilities, outcomes, and solutions.

The force commander conducts TEWT as a preliminary field exercise. It establishes the link between map exercises and STXs conducted with all unit soldiers and equipment. During the TEWT, leaders confirm the effects of terrain and weather on a breaching operation. They walk through all types of breaching operations, confirming the locations and actions of the support, assault, and breach elements. The TEWT gives leaders an excellent appreciation of the terrain considerations for executing critical collective tasks such as Perform Reconnaissance, Attack by Fire, or Assault Enemy Positions.

As a final step before leading a unit in a combined arms live-fire exercise (CALFEX), the commander and his staff plan, resource, and conduct STXs. These exercises are designed to bring the force to wartime standards of proficiency in breaching collective tasks. *ARTEP 71-2-MTP, Chapter 4*, presents an excellent discussion of the STX. The force focuses training and evaluation on a limited number of critical battle tasks. It has already achieved proficiency in all of the enabling component individual tasks and subunit collective tasks. The STX also requires support such as multiple integrated laser engagement systems (MILES) and evaluation teams. An opposing force (OPFOR) is highly recommended for STX breaches against defended obstacles.

STXs for the in-stride breach should challenge subordinate units with a variety of lightly defended or undefended obstacles. Subordinate commanders must be required to execute breach action drills against a variety of obstacles with little or no OBSTINTEL. This realism will reinforce the rapid and accurate decision making required of the TF and company team in choosing the best means of obstacle reduction. Deliberate breaching STXs should also test the force against a variety of obstacles. However, OBSTINTEL should be relatively detailed and timely to allow the force to configure and rehearse for the specific enemy and obstacle system.

During collective task training, the company teams and TFs will develop a high level of proficiency in combined arms breaching. This will allow them to modify MTP tasks by adding steps and procedures. These modifications will raise the standards beyond those established in MTPs. They will also allow units to function smoothly and rapidly with organic assets and other critical assets such as supporting engineers and artillery. The division and separate brigade will develop standardized breaching actions used throughout the force from the tasks defined in MTPs. This will enable them to execute support, assault, and breach-force missions against a variety of enemy and obstacle situations, regardless of task organization. The following factors may require a specific breaching action based on the MTP foundation task:

- Mission at the time of the breaching operation.
- Designation of units as support, breach, or assault for the TF.
- Amount of engineer and breaching assets available.
- Enemy direct and indirect fires.
- Type of obstacle system encountered.
- PIRs needed to plan and execute a breaching operation.
- Number of lanes to prepare in the obstacle reduction.
- Type and amount of obscuration required.
- Availability of friendly direct and indirect fire.
- Terrain.

USING THE COMBINED ARMS LIVE-FIRE EXERCISE

The CALFEX is the ideal tool for simultaneously training all individual and collective skills required to successfully conduct breaching operations. The CALFEX provides leaders at the platoon, company, and TF level an excellent opportunity to train on synchronizing the full range of critical collective tasks involved in a breaching operation. Units integrate breaching tactics, actions, drills, and procedures with fire control and the sights, smells, and sounds of a lethal battlefield. More importantly, the CALFEX provides the commander with the chance to integrate breach training into an overall offensive operation. The commander can also tailor the CALFEX to include one or more types of breaching operations—in-stride, deliberate, assault, or covert. A CALFEX is the best form of rehearsal for the combined arms breach.

Because the CALFEX is a high point in a unit's training cycle, it must be carefully planned and resourced and must receive the personal attention of leaders at all levels. For the soldier, crew, and small-unit leader, the CALFEX represents the final test on which the worth of their hard training investment will be judged. It is also the yardstick by which soldiers and small units measure their own ability to win on the battlefield. The importance of the CALFEX to training success means leaders must ensure it is thoroughly planned, adequately resourced, realistic, and safe.

CALFEX planning begins with structuring the exercise so that it requires units to perform key collective tasks from the METL. The operations outline and the MTP are key sources for identifying critical collective tasks and subtasks to be incorporated into the CALFEX. Structure is important in meeting specific training goals; however, too much structure stifles leader training during the CALFEX. Commanders must design the CALFEX with enough flexibility so that leaders are required to make the same hard decisions they will be required to make in combat. This is particularly true

in breach training. For instance, during a CALFEX the lead company teams in a TF in-stride breach should not be limited to one MICLIC which the commander knows he is to use against the one minefield in his lane. Instead, each company team should be organized with several obstacle-reduction means (engineers, MICLIC, and/or ACE) and should be faced with several types of obstacles. The company team should conduct opposed and unopposed breaches. Above all, the leader must make the decision, with the scenario providing the information he needs.

The CALFEX must be completely resourced. As a minimum, resourcing includes support personnel, time, ammunition, fuel, facilities for CALFEX command and control, and unit after-action reviews. Proper resourcing is critical to preserving realism and ensuring that tasks are performed to standard. Commanders must be sensitive to the tendency to resource a unit with less than is required for the task, since it compromises executing the task to standard. For example, if the CALFEX requires a unit to breach a surface-laid minefield, the unit must have enough explosives to reduce the obstacle to MTP standard. Giving the unit only one or two blocks of TNT to simulate the breach is not acceptable. On the other hand, CALFEX training must be efficient to reduce waste of crucial training resources. Leaders planning the CALFEX must research the performance standards for each collective task to ensure that resource packages are complete but not wasteful.

The training benefit of the CALFEX stems directly from its potential for realism. When developing the CALFEX, realism must be preserved. Breaching realism is maintained by ensuring that enemy obstacles are emplaced according to the enemy's established doctrine and by using the enemy's obstacle-construction norms. The task to breach an obstacle must also be a realistic decision rather than a scenario requirement. Forcing a unit to maneuver down a lane to breach an obstacle when it does not support actions on the OBJ reinforces the breach as a necessary task during an attack. Lastly, conditions under which the breach is to be conducted must also be realistic. Smoke and simulated artillery enhance training realism but must be used carefully so they accurately complement the entire scenario. The soldier who sees, feels, and smells realistic conditions gains priceless confidence in his abilities and those of his leaders. However, forcing soldiers to breach in mission-oriented protection posture (MOPP) 4 when nothing prompted leaders to make the decision to increase their protective posture does not foster realism. Such artificial requirements must be avoided at any cost.

The CALFEX must be safe. This is not to say that safety and realism are mutually exclusive. Training soldiers and units to safely perform their individual and collective tasks under realistic battlefield conditions is an absolute must. It gives the soldier confidence in his leader, tools, and skills that cannot be gained in any other training environment. Training soldiers to be combat safe will protect them from the lethal effects of erratic, careless use of weapons and vehicles. Training a breach as part of a CALFEX presents the leader with some particular combat safety challenges. By the very nature of a breaching operation, units are executing multiple and diverse collective tasks simultaneously. Armor platoons or companies suppress with volley fire while engineers and infantry move forward to reduce the obstacle, securing by force if necessary. The engineers place explosives on detected mines, detonate the charges, and mark the breach while the infantry attacks a dug-in enemy squad on the far side of the obstacle. Assault forces attack through the breach lane to their OBJ, and the support force shifts its fires. The commander must not shy away from these challenges. Instead, he must train his unit to meet the safety challenge as they would in combat.

Figure 7-1, page 7-12, illustrates the improper integration of a deliberate breach into a TF CALFEX. The mission is to conduct a deliberate attack to destroy an MRC-sized force. The scheme of maneuver for the CALFEX is for the TF to maneuver on the left side of the range while the engineers maneuver on the right side. The TF plan of attack uses Teams Alpha and Bravo as the support force in overwatch at ABF position 15. Team Sapper moves on Axis Engineer to breach a lane in a known obstacle. Team Charlie moves through the breach and then maneuvers back to the left to assault the OBJ. Team Delta follows in support of Team Charlie's assault but does not use the breach lane. Artillery and mortar fires are used on the OBJ. Smoke is called in north of the breach lane so it will not hamper target acquisition by the support force and cause command and control problems for the unit. In short, the breach is conducted unnecessarily and in isolation from the overall scheme of maneuver.

Figure 7-2, page 7-12, shows a breaching operation properly integrated into the same CALFEX. Team Sapper maneuvers as part of the TF attack and breaches an obstacle that must be reduced for the TF to execute its actions on the OBJ. Teams Alpha and Bravo provide suppression through volley direct fires and by controlling indirect fires. The TF commander positions himself with the support force to ensure their fires shift as Team Sapper moves forward. Smoke is used and adjusted to obscure the breach from the same enemy targets the support force is suppressing. The support force observes dug-in enemy infantry that are firing on the OBJ; the two infantry platoons with Team Sapper dismount to attack. The breach force commander tracks their progress and that of the engineers setting the charges on enemy mines. He tracks the battle and advises the infantry when the charges will be detonated. Observing the infantry under cover, the breach force commander does not prevent the sappers from blowing the charges. Teams Charlie and Delta are also observing the progress and are ready to attack through the

lane as soon as they receive the signal. During actions on the OBJ, the entire force uses the lanes created during the breach. Team Sapper continues to construct additional lanes for the TF to use during consolidation.

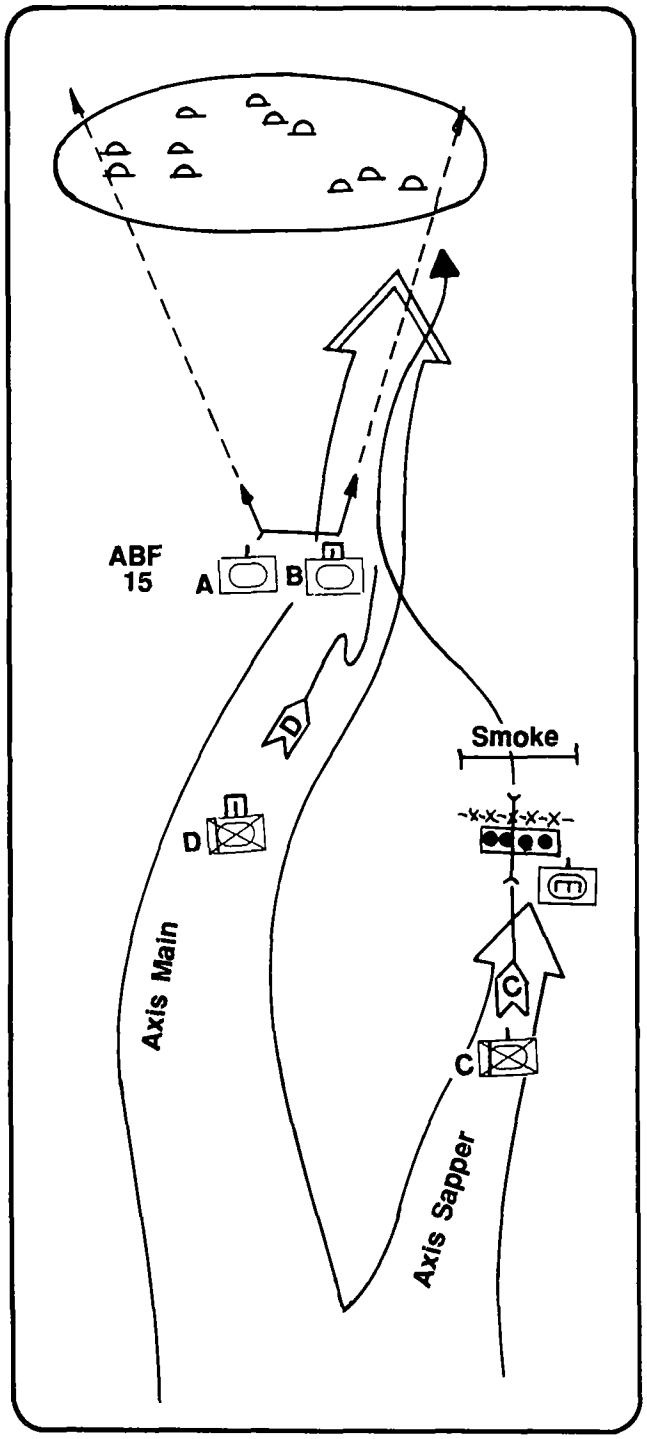


Figure 7-1. Inproper intergration of a breach into a CALFEX.

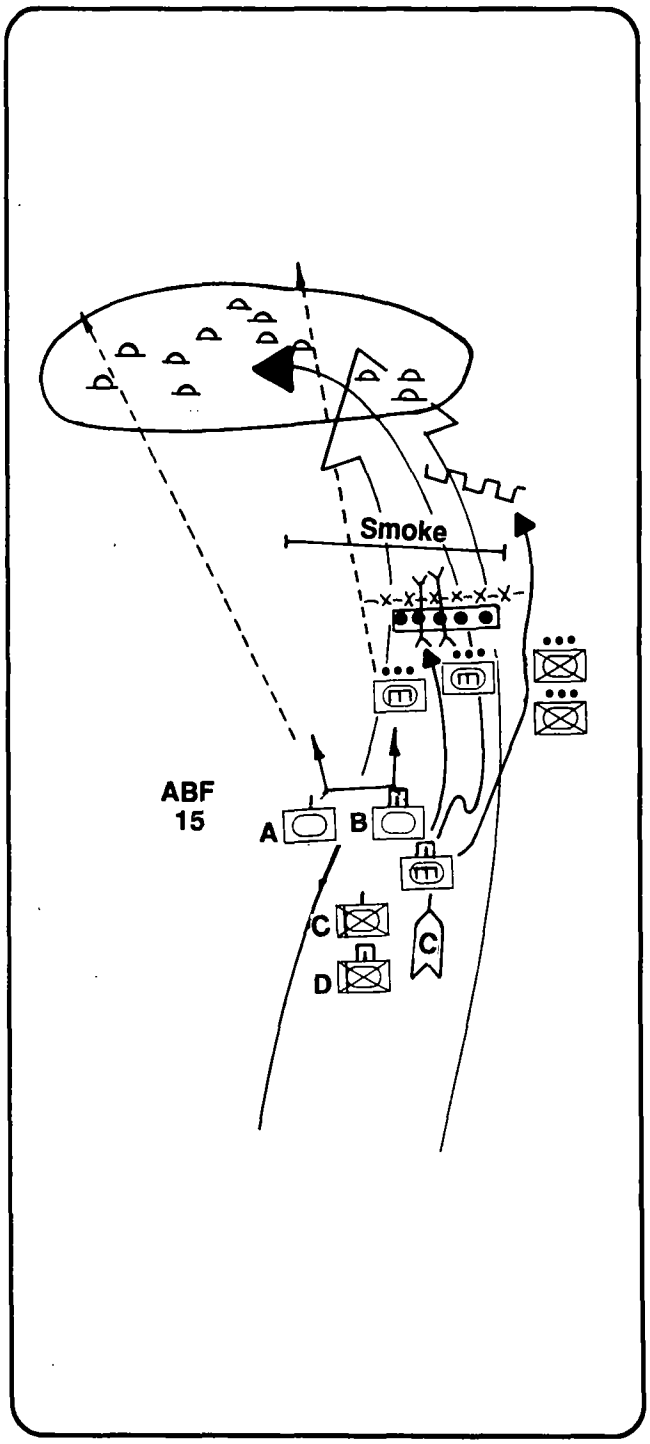


Figure 7-2. Proper intergration of a breach into a CALFEX.

Appendix A
Soviet Obstacle Warfare

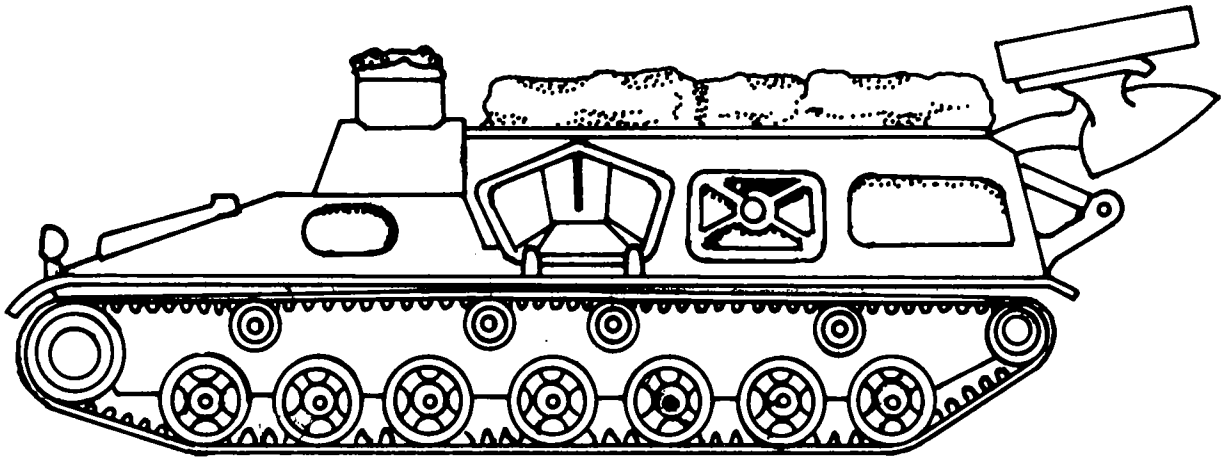
This appendix discusses some of the tactics, techniques, and procedures used by the Soviet army in obstacle employment. The information presented applies to most Soviet-style armies and their surrogates. This appendix is intended to complement the information presented in other field manuals (FMs) on Soviet tactics obstacle warfare. Commanders should use this information to give added realism to unclassified staff and combined arms team training. Obstacle employment norms may change with the factors of METT-T for a given area of operations. Therefore, preoperational training on templating, intelligence, reconnaissance, and reduction procedures must be based on the best information available before deployment.

MINEFIELDS

Soviet formations contain considerable organic obstacle-emplacement capability. Soviet rapid-mining capability presents a serious challenge to friendly maneuver. *Figure A-1* summarizes mechanical minelayer assets organic to Soviet regiments and divisions.

To rapidly lay mines and place obstacles during offensive operations, the Soviets form a special team called the POZ, also called the Soviet mobile obstacle detachment, from regimental and divisional assets. The POZ places AT mines on the most likely avenues for armored attacks or counterattacks. Additionally, they are equipped to crater roads or destroy bridges along these routes. POZs are positioned on the flanks of a march formation for rapid deployment and are normally in close proximity to the AT reserves. During the march they reconnoiter avenues into the flanks and identify the most likely avenues for tank movement. At secured objectives, the POZ reinforces existing obstacles and places new obstacles to help defeat any counterattack.

The combined arms commander orders the organization of the POZ and determines its composition based on the combat situation and the available troops. The engineer



GMZ
(Gusenichnyy Mino-Zagraditel')

Allocation

3 per Soviet division
3 per motorized rifle and tank regiment
15 GMZs total per Soviet division

Figure A-1. Soviet armored tracked minelayer (GMZ).

elements in a division POZ come from the divisional engineer battalion and consist of three armored tracked minelayers (Gusenichnyy Mino-Zagraditel' (GMZ)). This platoon-sized element will have two to three trucks carrying mines for immediate resupply. For the regimental POZ, the regimental engineer company can provide a platoon-sized unit which is equipped with two or three GMZs. This platoon would travel in their BTR-50/60 and have 600 AT mines and 200 kilograms of explosives available.

The GMZ dispenses mines at a predetermined spacing of 4 to 6 meters. Minelaying helicopters support the POZ, with the HIP or HIND-D helicopters carrying two to three dispenser pods of AP or AT mines. Artillery-fired SM could also support the POZ. Three GMZs can lay a 1,200-meter three-row minefield containing 624 mines in 26 minutes (doctrinally this minefield would be broken into several minefields, each 200 to 300 meters long).

The Soviets use obstacles extensively throughout the depth of their defense. Training at the National Training Center (NTC) has repeatedly shown that their tactics are well chosen. Shallow obstacles are breached quickly and easily. For example, a shallow minefield with one row of mines is essentially breached after one or two mines in the row are blown. The Soviets' rapidly placed minefield consists of three or four 200- to 300-meter-long rows spaced 20 to 40 meters apart with mines spaced 4 to 6 meters apart. As a rule, the minefield covers the depth of a football field. *Table A-1* gives more details on the dimensions of the standard Soviet AT and AP minefields. Terrain and tactical situations dictate actual dimensions and distances of minefields. *Figure A-2, page A-4*, shows a rapidly placed minefield. The Soviets typically use such a minefield when in a hasty defense (offense is temporarily stalled). *Figure A-3, page A-4, and Figure A-4, page A-5*, show standard antitrack and antihull minefields. *Figure A-5, page A-5*, shows a standard AP minefield.

The Soviets can also be expected to emplace what they call "mixed minefields," which are not the same as US mixed minefields. They normally emplace three rows of AT mines, then several rows of AP mines. The AT and AP mines ARE NOT mixed in the same row. *Figure A-6, page A-6*, illustrates a mixed minefield reinforcing an AT ditch.

Soviet engineers use two fundamental drills to emplace mines. When emplacing armed mines, the drill uses a crew of five sappers. The first crew member (the senior man and operator) is in the minelayer seat monitoring the operation of the minelayer and the motion of the mines in the guide chute; he sets the mine spacing and controls the actions of the GMZ. The second, third, and fourth members are in the GMZ. The second and third members take mines out of the containers and place them in the intake chute at intervals between the guide tray's drive chain. The GMZ driver steers the vehicle along the indicated route at the established speed.

When emplacing unarmed mines, there are two or three additional sappers assigned to arm the mines. After emplacing the mines, one sapper trails the minelayer, marks emplaced mines with pennants, and partially places the camouflage over the mines. The other two sappers then arm the mines.

AP minefield emplacement is similar to AT minefield emplacement except that special precautions are taken. Soviet doctrine allows only surface laying of PMN mines from minelayers. POMZ-2M mines are emplaced with the truck and tray technique (PPMP). Extra effort is required to assemble, emplace, and deploy the trip wire and camouflage the POMZ-2M mine.

Using three GMZ-tracked minelayers, a Soviet POZ can emplace 1,200 meters of a three-row AT, surface-laid minefield containing 900 AT mines in 15 minutes (see *Figure A-7, page A-6*). This does not include a 12- to 15-minute reload or travel time. Both travel and reload times increase during limited visibility.

ANTITANK DITCHES

Soviet regiments and divisions have considerable earth-moving capability. *Table A-2, page A-7*, lists basic Soviet earth-moving equipment. The BTM trench digger is primarily used to dig infantry into trenched fighting positions. The MDK-4 is primarily used to dig vehicular fighting positions. The BTU tank dozer blade for the T54, T55, and T62 tanks and IMR blades are used to breach obstacles; they are not well suited for AT ditching and survivability work. The BAT-2 tracked dozer and the MDK-3 create AT obstacles and dig field fortifications. The T72 and later model tanks are equipped with self-entrenching blades for digging positions only. Because the minefield can be more rapidly emplaced and recovered, the Soviets use minefields more often than AT ditches in obstacle systems. The Soviets have the capability to dig extensive AT ditches; however, survivability positions must be completed first.

SOVIET DEFENSIVE OBSTACLE EMPLOYMENT CONCEPTS

If Soviet forces have to go into a defense, they will do so quickly and in a very organized manner. With the amount of engineer equipment available and with integral blades on their tanks, they can dig themselves in and emplace protective obstacles in less than a day. Once the obstacles are emplaced, their general priorities are protection to the flanks, the seams between units, and the fronts of positions. Tactical obstacles are used to shape fire sacks. The first priority for use of nonexplosive obstacles is to protect the force. With protection complete, nonexplosive obstacles are then used forward in the fire sacks. Wire obstacles are used to protect flanks and to support explosive obstacles.

Table A-1. Normal parameters for Soviet minefields.

Antitank Minefield	
Front (situation dependent)	200 to 300 meters
Depth	60 to 120 meters
Distance Between Rows	20 to 40 meters
Number of Rows	3 to 4 rows
Distance Between Mines	4 to 6 meters for antitrack mines 9 to 12 meters for antihull mines
Outlay, Normal	550 to 750 antitrack mines/kilometer 300 to 400 antihull mines/kilometer
Outlay, Increased Effect	1000+ antitrack mines/kilometer 500+ antihull mines/kilometer
Probability of Destruction	0.57 for antitrack mines (750/kilometer) 0.85 for antihull mines (400/kilometer)
Antipersonnel Minefield	
Front	30 to 300 meters
Depth	10 to 150 meters
Distance Between Rows	5+ meters for blast mines 25 to 50 meters for fragmentation mines
Number of Rows	2 to 4 rows
Distance Between Mines	1 meter for blast mines 50 meters or twice the lethal radius of fragmentation for fragmentation mines
Outlay, Normal	2,000 to 3,000 for HE/blast mines (2,000/kilometer) 100 to 300 for fragmentation mines
Outlay, Increased Effect	2 to 3 times normal outlay
Probability of Destruction	0.15 to 0.2 for HE/blast mines (2,000/kilometer) 0.1 to 0.15 for fragmentation mines (100/kilometer)

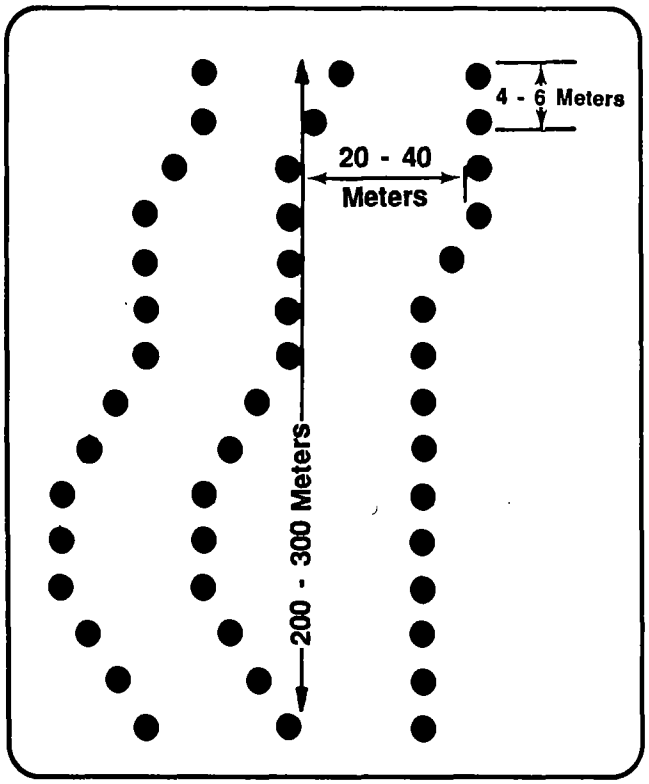


Figure A-2. Soviet rapid minefield.

The MRC commander's obstacle concern is for self-protection. The protective obstacles will be placed 50 to 500 meters from the defensive fighting positions.

The MRB commander's obstacle concern is for the flanks of subunits and the MRB and to shape the fire sacks. Obstacles are placed at one-half the effective range of the AT weapons systems covering them.

The COP commander's obstacle concern is to appear as the MRB's main defense by delaying and disrupting the attacker and turning them into the MRB's fire sack. This is the first place an attacker will see obstacles. Tactical obstacles are placed at two-thirds the effective range of the COP's AT weapons and assist in their withdrawal to the main defense.

The type and complexity of an obstacle depends on the installing unit. Maneuver and artillery soldiers install simple single-system minefields that are usually protective in nature. Engineer soldiers install complex obstacles that CAN include antihandling devices. Engineer obstacle placement is usually equipment-intensive. Soviet engineer effort generally concentrates on tactical obstacles unless maneuver soldiers are unable to employ the necessary protective obstacles.

The Soviets continue to improve the obstacles supporting their positions by marking the friendly side of obstacles,

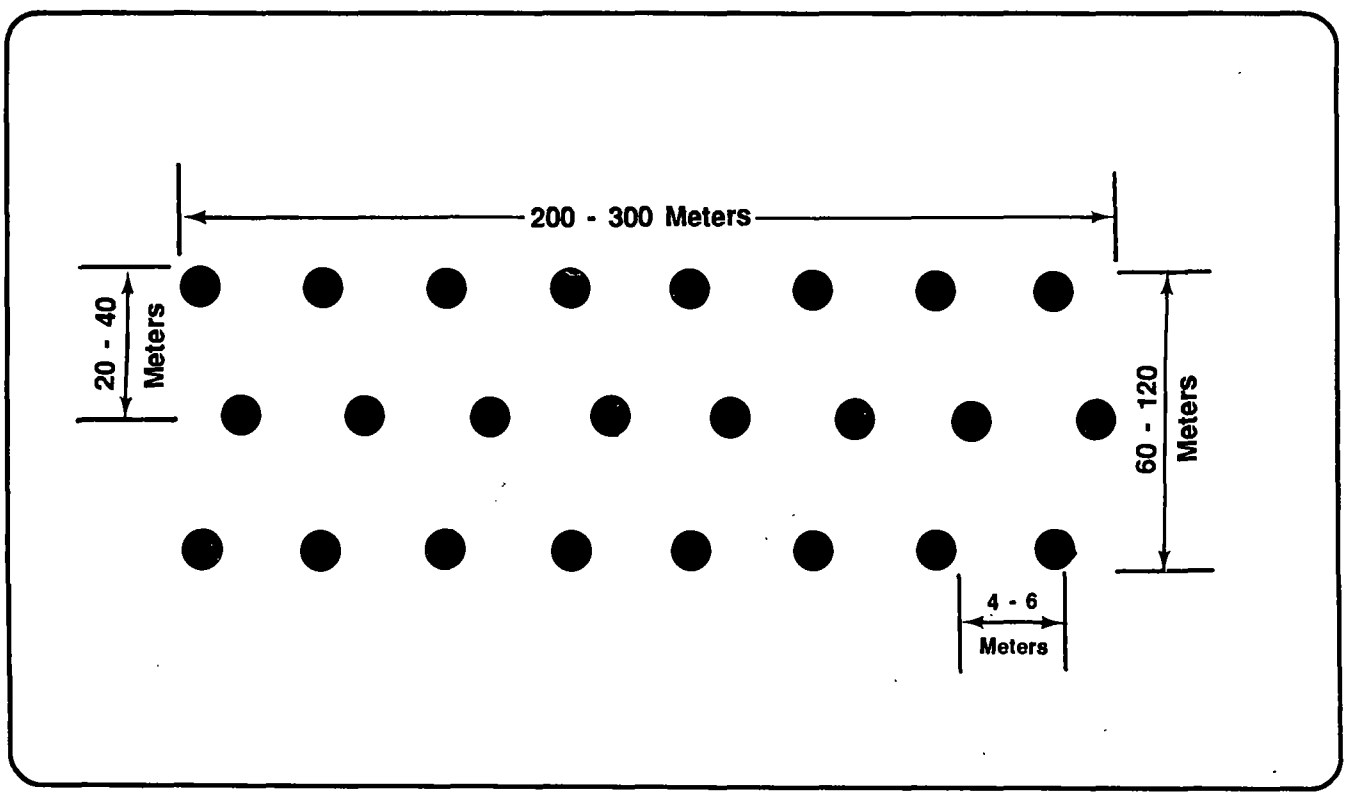


Figure A-3. Soviet antitrack minefield.

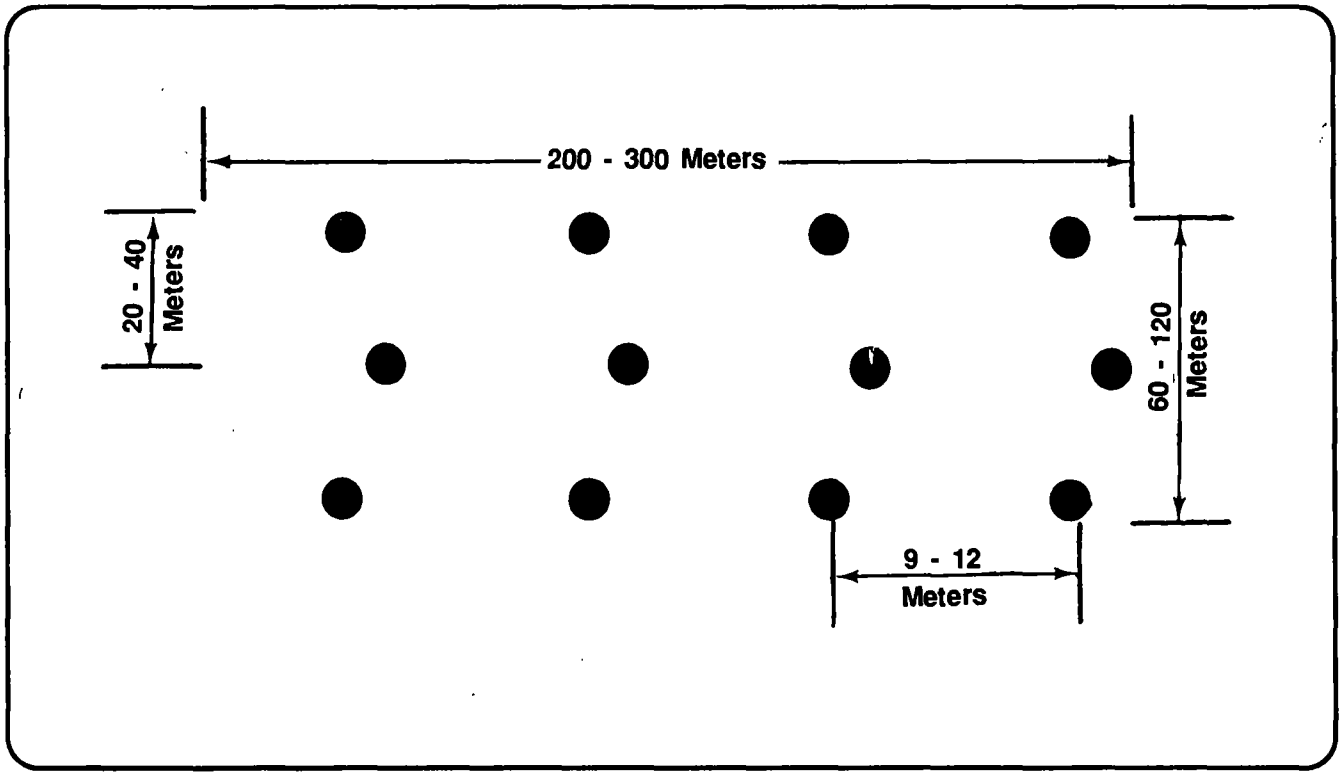


Figure A-4. Soviet antihull minefield.

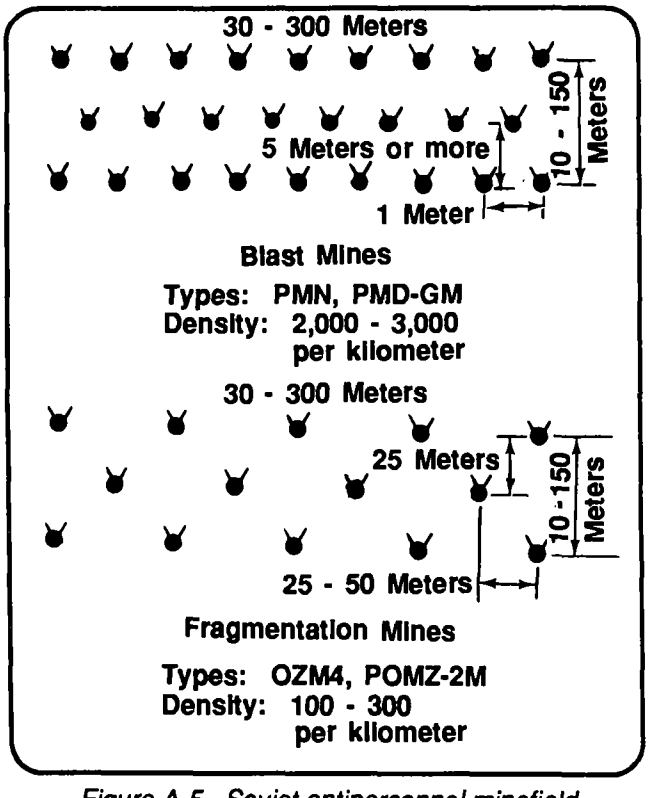


Figure A-5. Soviet antipersonnel minefield.

burying mines, and adding antihandling devices. They will also emplace deceptive positions and obstacles.

TACTICAL USE OF SOVIET OBSTACLE EMPLOYMENT NORMS

The Soviet army has established norms and priorities of work for obstacle employment which are the foundation of Soviet defensive preparations and are rigidly adhered to by Soviet commanders. Understanding these norms is an invaluable tool for an attacking force. They enable the commander and his staff to identify the strengths and weaknesses of an enemy defense. *Table A-3, page A-8*, shows possible enemy obstacle activities and their tactical significance to an attacker; analysis is based on the Soviet obstacle employment norms.

In short, understanding Soviet obstacle norms enables the commander and staff engineer to focus reconnaissance efforts, analyze hard intelligence reports, and make decisions about their own plans. How to integrate OBSTINTEL into the planning process and collection effort is covered in *Appendix B*.

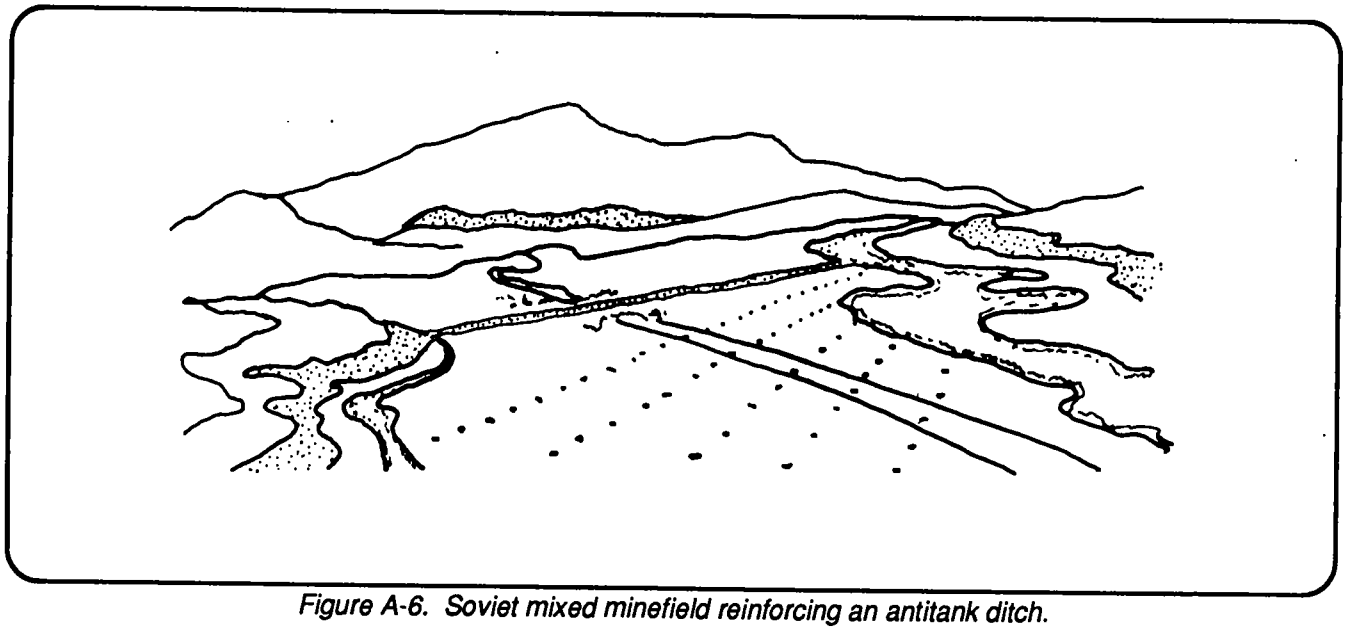


Figure A-6. Soviet mixed minefield reinforcing an antitank ditch.

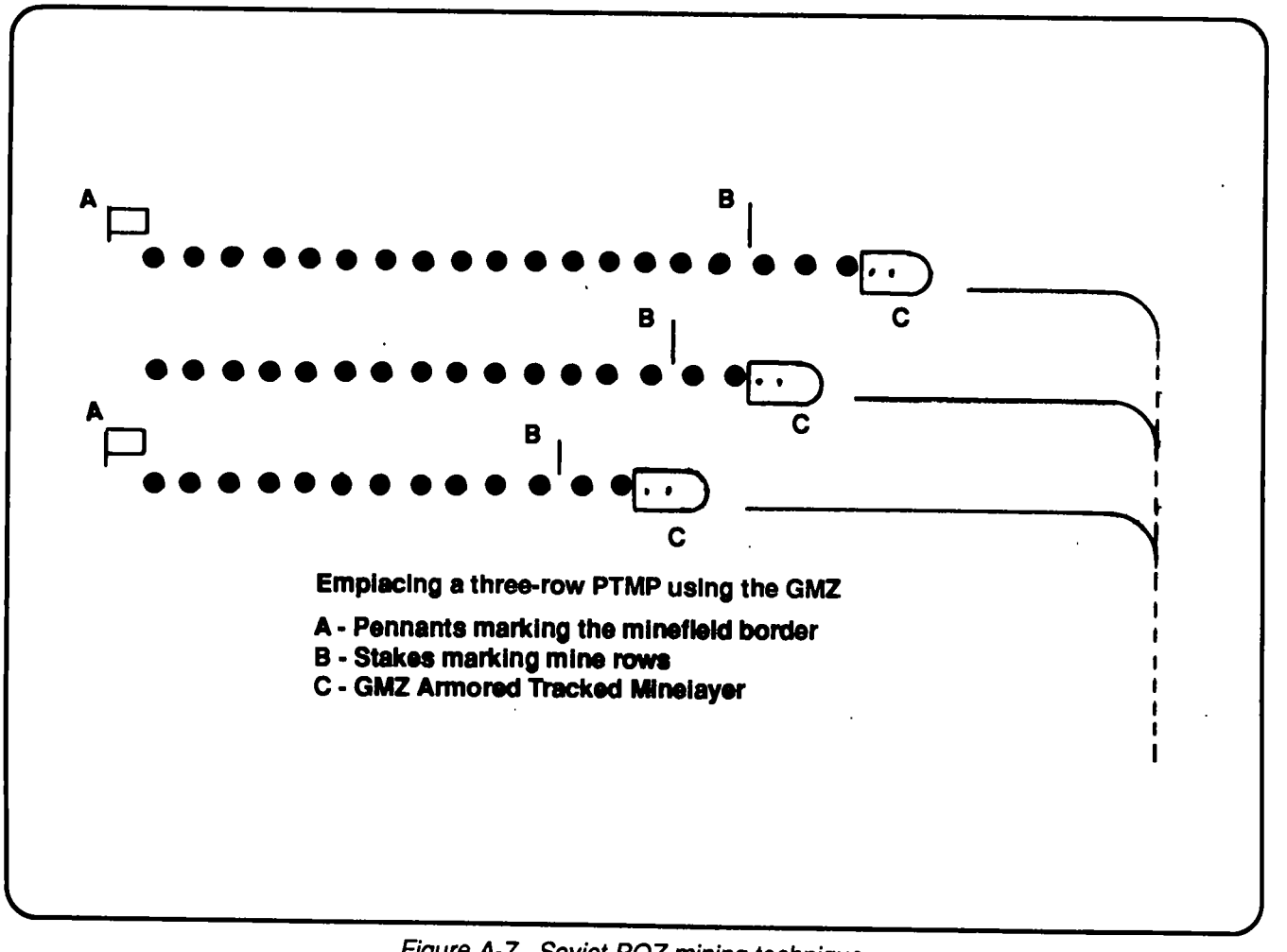


Figure A-7. Soviet POZ mining technique.

Table A-2. Soviet earth-moving capability.

Type	Mission	Capability	TR	MRR	TD	MRD
[1]BTM-3	Trench Ditching	1 meter wide by 1.5 meters deep 240 to 500 cubic meters per hour	1	1	4 *8	4 *8
[1]MDK-3	Ditching/AT Ditch	4.0 meters wide by 4.4 meters deep 120 to 300 cubic meters per hour or 12 hull defilade positions per hour	1	1	4 *8	4 *8
BTU	Tank Dozer Blade	Mobility or fighting position 150-250 cubic meters per hour	3	3	0 *12	0 *12
BAT-2	Tracked Dozer	Mobility/Countermobility/ Survivability 35 to 50 meters of AT ditch per hour	1	1	8 *12	8 *12
PZM-2	Trench Digging	Mobility/Countermobility/ Survivability 3.5 meters wide by 1.5 meters deep 60 meters of AT ditch per hour	3	3	0 *12	0 *12
IMR	Engineer Tractor	Mobility/Survivability Blade: 3.5 cubic meters Bucket: 0.15 cubic meters	1	1	2 *6	2 *6

*Denotes totals for the division

[1]Units may have the BTM-3 or the MDK-3

Table A-3. Tactical significance of Soviet obstacle activities.

Observed Enemy Obstacle Activity	Tactical Significance
Protective obstacle activity.	The enemy shifts to a hasty defense.
Protective obstacle effort on unit's flanks and on the seams between adjacent units.	The enemy is working on its first priority; defense preparations have just begun.
Protective obstacle effort along the forward edge of dismounted and vehicle fighting positions.	This is the last phase of protective obstacle effort; priority of work will soon shift to emplacing tactical obstacles.
Troops emplacing protective mines in strips perpendicular to their positions or trench line.	The minefield is being emplaced by maneuver troops (infantry, armor, and artillery); presence of trip wires and antihandling devices is unlikely. AP mines will be the blast type and pressure detonated. The enemy commander determines his defense is currently unthreatened and has decreased security to allow maneuver soldiers to emplace protective mines.
Troops emplacing protective mines in strips parallel to their positions or trench line.	The minefield is being emplaced by engineers and the presence of trip wires and antihandling devices is more likely. AP mines may be fragmentary or blast type and either pressure or trip wire detonated.
Protective and tactical obstacle emplacement conducted concurrently.	The enemy is preparing a deliberate defense and is unable to resume the offense for some time. Protective obstacles are being emplaced by maneuver troops while engineers are emplacing the tactical effort.
Tactical obstacle effort.	This helps confirm the location, orientation, and type of weapons used by combat forces in the enemy's main defensive belt. Tactical obstacles are emplaced at approximately one-half the range of weapons in the main defensive belt.
Tactical obstacle effort activities located well beyond one-half the range of weapons in the main defensive belt (assume the location of main defensive belt is confirmed).	Observed obstacles may be specifically covered by the antitank guided missile (ATGM) reserve whose location will be 3000 meters from the obstacle. The observed obstacle may support the COP who will emplace obstacles at two-thirds of their weapons range trying to deceive the attacker on the location of the main defensive belt.
Obstacle activity observed beyond the expected enemy engineer capability.	The enemy force may have received extensive engineer reinforcement from its higher headquarters indicating the main effort. Enemy force is making extensive use of decoy minefields and may be using decoy positions.
Employment of minefield marking systems.	This indicates the enemy's side of the minefield (friendly side from the defender's perspective).

Appendix B
Intelligence Preparation of the Battlefield

IPB is a systematic and continuous process that analyzes enemy, weather, and terrain in an area of operations. The IPB process integrates enemy doctrine and mission with the effects of weather and terrain to evaluate enemy capabilities, vulnerabilities, and probable COAs.

The IPB process is crucial to breaching success. To successfully integrate the threat, the force must identify critical intelligence requirements and conduct intelligence gathering using all its available assets. This greatly increases its capability to make counterobstacle decisions and to accomplish the breach. The force that attacks with a plan predicated on a nonexistent, unverified, or poorly integrated threat template sacrifices the initiative to the enemy. An incomplete IPB invites the enemy to attack with unseen obstacles and forces.

When analyzing terrain using the five military aspects of terrain—observation and fire, concealment and cover, obstacles, key terrain, and avenues of approach (OCOKA)—the force engineer focuses on obstacles. He identifies all existing and reinforcing obstacles and the effort required to use or overcome those obstacles.

The S2's threat evaluation consists of a study of the enemy's order of battle (OB) or, when such detailed OB data is not available, a generic doctrinal template. The staff engineer assists the S2 in conducting this threat evaluation. Based on knowledge of the OB, enemy obstacle tactics (such as the Soviet obstacle tactics in *Appendix A*), and the time available to the enemy, the staff engineer evaluates the enemy's obstacle capabilities. This evaluation considers constraints of terrain or weather to quantify minefield, AT ditching, wire obstacle, scatterable mining, and explosive obstacle capabilities.

The S2 relates the threat evaluation to the terrain and weather and develops the situation, event, and decision support templates. The situation template is a doctrinal template with terrain and weather constraints applied. The S2 uses his tactical sense and known information to fit enemy forces to specific terrain. The staff engineer assists the S2 by fitting the enemy obstacle information to the situation template based on the obstacle capabilities, obstacle indicators or previous OBSTINTEL, knowledge of enemy obstacle tactics, terrain, and weather, and engineer judgment. As the S2 continues to develop probable enemy COAs, the staff engineer integrates likely enemy obstacle employment.

The next step is the event template. The event template analyzes and identifies significant battlefield events and enemy activities that confirm the enemy's COA. The S2 designates areas where significant enemy events and activities may occur as NAIs. NAIs focus intelligence collection, R&S, and situation analysis. Surveillance of enemy obstacle activities in NAIs collects important information and reveals the enemy's intentions and actions. Joint analysis of this information by the S2 and the staff engineer is critical to confirming or denying the situation template. The following examples illustrate how obstacle activities help develop the situation:

- A threat force attacking along a mobility corridor and deploying extensive flank obstacles may be planning to envelop from the opposite flank or is anticipating a friendly attack on the obstacled flank.
- Buried minefields, mechanically or hand emplaced, indicate that the enemy is establishing a defense and not simply conducting a short halt before resuming the offense.

The event template is further developed into a DST. The DST relates key battlefield events, decisions, and actions in graphic form. The commander and staff begin developing the DST by using the situation and event templates to identify areas where fires and/or maneuver can influence the action. These areas are designated (NAIs are redesignated) as target areas of interest (TAIs). The commander uses decision points (DPs) to indicate points on the ground where he must make tactical decisions to fire or maneuver his force to a TAI. DPs must be chosen to allow the commander enough time and space to react, adjust the plan, and execute accordingly.

The commander uses the DST to make timely breaching decisions during an attack. The situation and event template are tools used to identify a weakness in the enemy defense where the attacker can establish a foothold. The enemy's vulnerability is then targeted by indirect fires and the maneuver plan; the foothold becomes a TAI. NAIs are established to focus on confirming the weakness of enemy obstacles and fires. For example, the commander organizing his force for an in-stride breach makes plans for shifting to a deliberate breach. The commander designates a DP on the ground that gives him enough time to reorganize his force and execute a deliberate breach. At this point he must assess the results of his reconnaissance efforts and decide whether to proceed with his in-stride organization or to shift to a deliberate breach.

Time lines are useful adjuncts to decision templating and help guide the continuous intelligence-gathering effort during the breach and attack. The time line may be used by the commander to—

- Focus reconnaissance for hasty minefields emplaced by a retreating force.

- Identify where the threat will employ situational obstacles in response to our attack.
- Anticipate the arrival time of enemy counterattacks.

As a result of the IPB process, the S2 develops intelligence requirements necessary to verify his picture of the battlefield. The commander designates intelligence requirements critical to the success of his plan as PIRs. The commander chooses PIRs based, in part, on the recommendation of the S2 and his engineer. The S2 develops an intelligence collection plan, in coordination with the S3 and engineer, and assigns R&S missions to intelligence collection resources. Enemy employment of obstacles in specific locations (NAIs) may be identified as PIRs, since such information is critical to verifying the entire situation template. Confirming obstacle locations gives the attacker a great deal of information about the location of enemy forces, weapons capability, and organization of fires. This information in turn is used to refine the scheme of maneuver.

Engineer platoons and squads execute reconnaissance missions alone or in conjunction with scouts and other intelligence-gathering assets. Engineers are trained to conduct obstacle and fortification reconnaissance to evaluate the technical nature of these works. Scouts and infantry also conduct obstacle reconnaissance and are experts in tactical maneuver and reconnaissance. By employing engineers, maneuver elements, scouts, GSR, and other assets, the force commander verifies the situation template or corrects the battlefield picture and adjusts his offensive plans.

In the following example, TF Tank has been issued a warning order and a rough situation template from the brigade S2 (see *Figure B-1*). The initial situation template places an enemy MRC, reinforced with undetermined obstacles, astride a mounted avenue of approach. The MRC is the TF objective.

The TF S2 and engineer take the brigade template and update the enemy situation *(see Figure B-2)*. The commander approves the PIRs. The S2, S3, and TF engineer prepare a collection plan that includes PIR requests from brigade intelligence assets such as GSR, artillery direction-finding batteries, and taskings for TF Tank subunits (see *Figure B-3*).

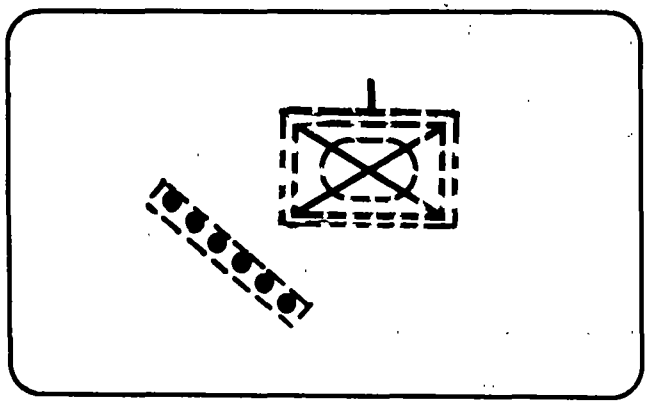


Figure B-1. Initial situation template.

The TF Tank reconnaissance plan tasks the scout platoon to conduct detailed reconnaissance of Axis Strike, enemy positions (NAIs 1, 2, and 5), the templated tactical obstacles (NAIs 3 and 4), templated regimental artillery group (RAG) position (NAI 7), and the location of the templated reserve (NAI 8). The scout platoon leader develops his plan to reconnoiter the NAIs. He directs the attached engineer squad to reconnoiter NAIs 3 and 4 on Route Bravo. The scout routes Charlie and Alpha to reconnoiter the other NAIs with his scout sections (see *Figure B-4, page B-4*).

While the R&S plan is executed, the TF Tank staff continues the command estimate. The commander decides on COA 1 for TF Tank's attack (see *Figure B-5, page B-4*). The plan starts taking shape with control measures, task organization, direct and indirect fires synchronization, and the plans phase to transition to a hasty defense. Reports begin to flow in from the scouts and engineers. The hard intelligence reports deny the situation template that was originally completed (see *Figure B-6, page B-5*). The S2 and TF engineer use the reports and build a more accurate picture of the enemy situation. From the updated template, the enemy is oriented differently and shows more countermobility effort along the Axis Strike (see *Figure B-7, page B-5*). The S2 and engineer develop additional NAIs and task the scout platoon to reconnoiter them. TF Tank war-games the plan and adjusts it to attack an anticipated enemy weak point (see *Figure B-8, page B-6*).

Figures B-1 through B-6 illustrate the continuous IPB process that is critical to the attack and success of the breach. The time required to refine the initial (relatively inaccurate) situation template, based on the scout and engineer reconnaissance reports received, is an indicator of staff agility and training (see *Table B-1, page B-6*). The new, detailed intelligence is used as a basis for modifying attack and breaching plans.

Planners use the situation template to identify the enemy elements requiring suppression, including their size and relative locations. From this, they establish the size of the support and assault force and the location of ABF positions and they assign assault objectives. Artillery and smoke targets are identified based on the template. The presence of dismounted infantry and the likelihood of counterattacking forces near the breaching site determine security requirements. Engineers prepare to breach obstacles shown on the template by constructing rehearsal areas for breach preparation that replicate expected obstacles and enemy positions. Finally, the commander war-games using the template, ensuring that he has plans to handle contingencies.

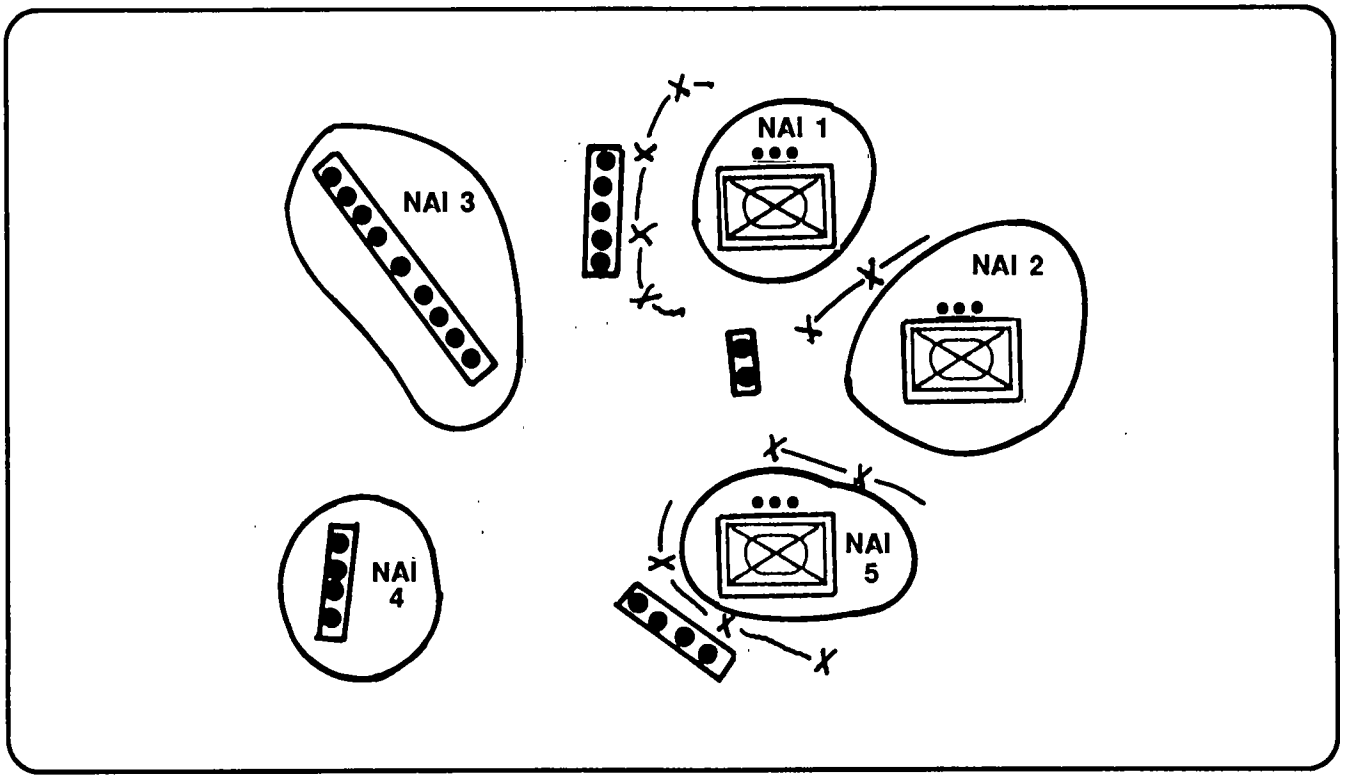


Figure B-2. Refined situation template.

R&S Requests/Responsibilities					Decision Points		
NAI	Higher	RII	TF	Subunit	TF TAI	Activity	Action
1	1st Bda	TF Mach		Scouts	Mortar	Location of anemy forcaa	Exacuta TAI 1
2				Scouta	Mortar	Location of anamy forces	Exacuta TAI 2
3	1st Bde	TF Mech		Engr Sqd		Location of anamy tactical obstacla	
4				Engr Sqd		Location of enamy tactical obstacla	
5				Scouta	FA	Location of enemy forcaa	Execute TAI 5
6	1st Bde		GSR	Scouts	FA	Location of MRB counter-attack	Exacuta TAI 6
7	1st Bde			Scouta		Location of RAG	Notify Bda for Div counterbattery
8				Team Tank		Axia Strike to PL Tackla	

Figure B-3. TF Tank intelligence collection plan.

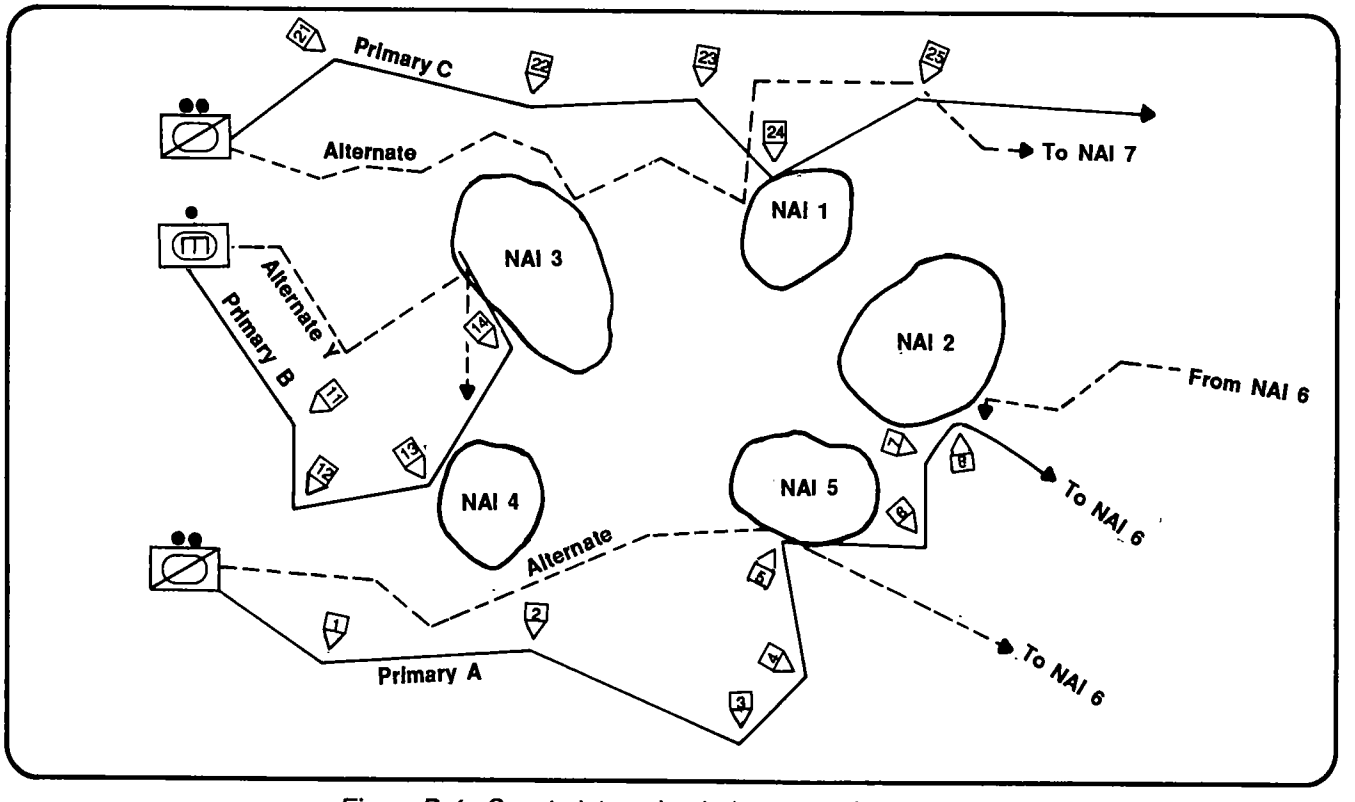


Figure B-4. Scout platoon leader's reconnaissance plan.

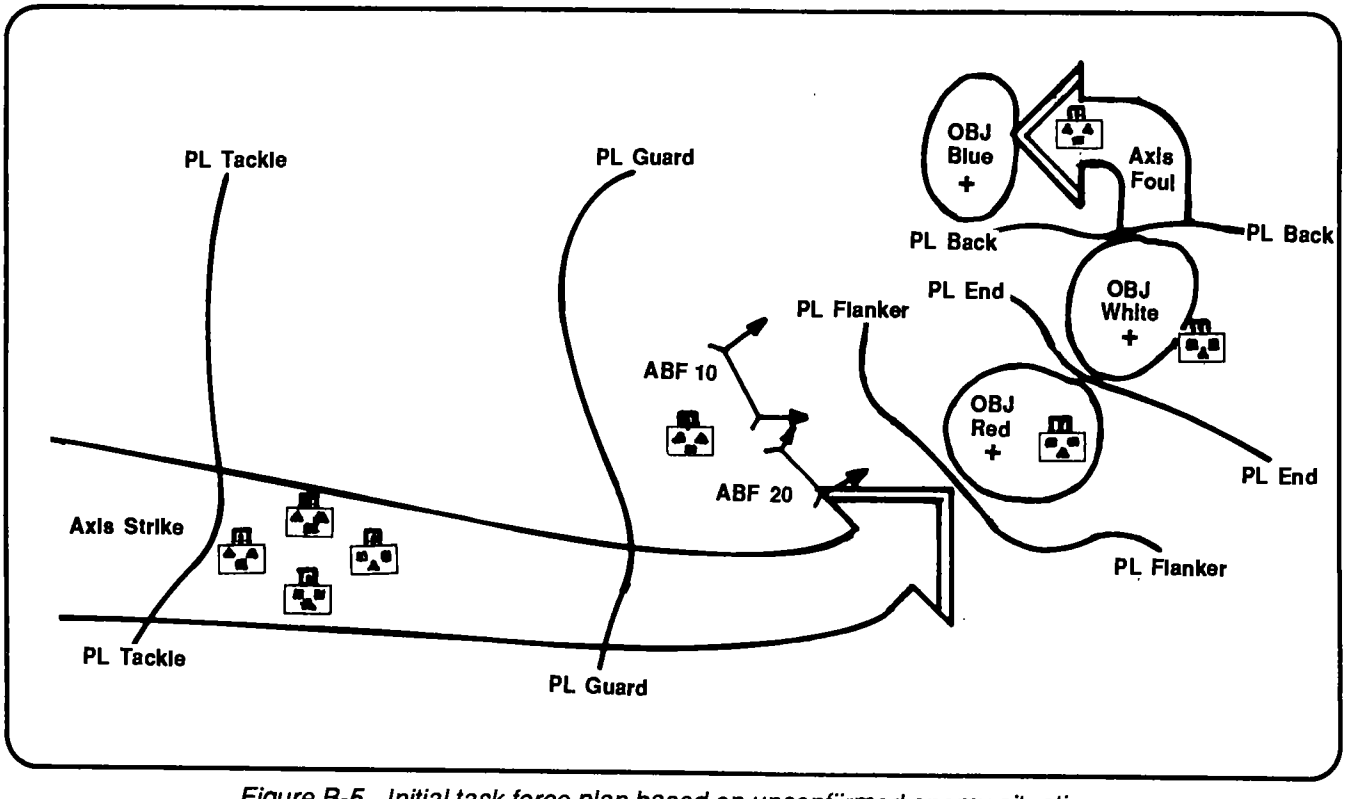


Figure B-5. Initial task force plan based on unconfiirmed enemy situation.

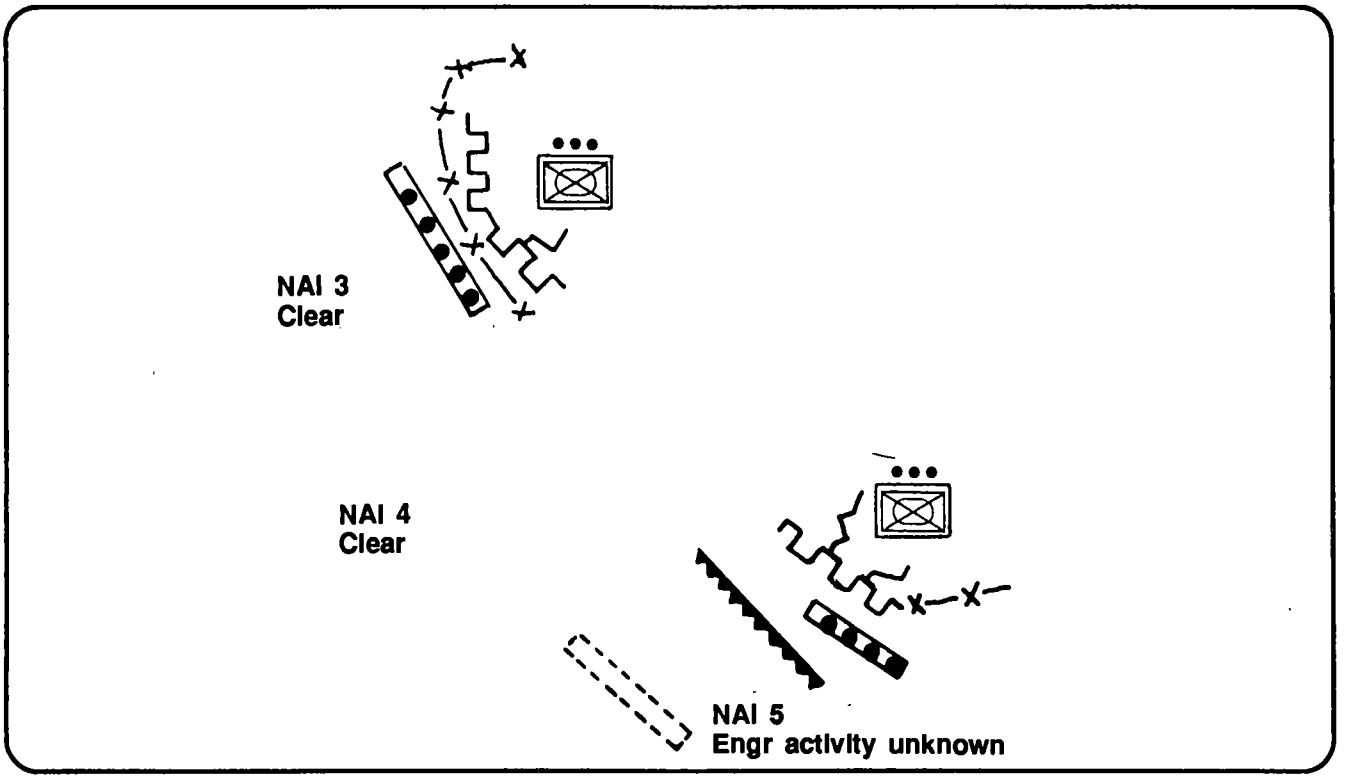


Figure B-6. Hard intelligence from scouts and engineer reconnaissance.

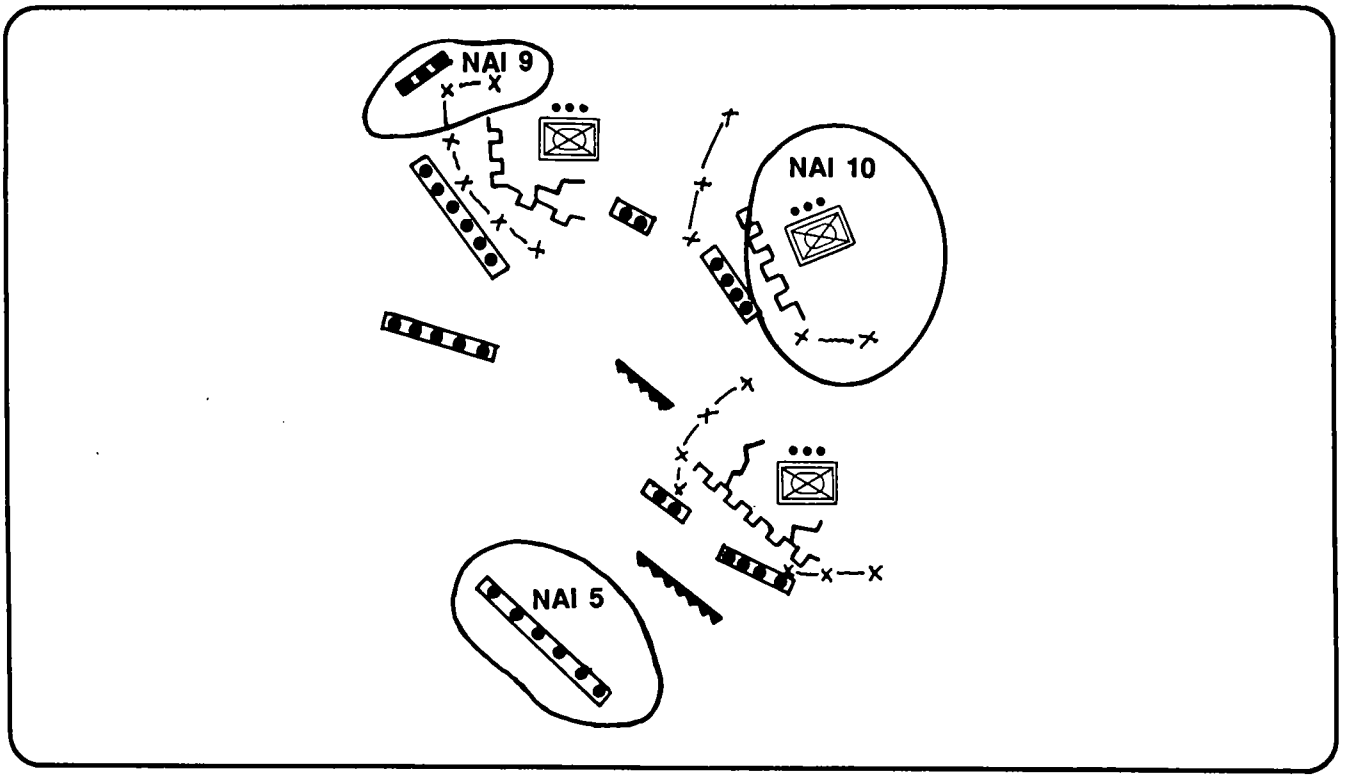


Figure B-7. Updated situation template and refined reconnaissance and surveillance.

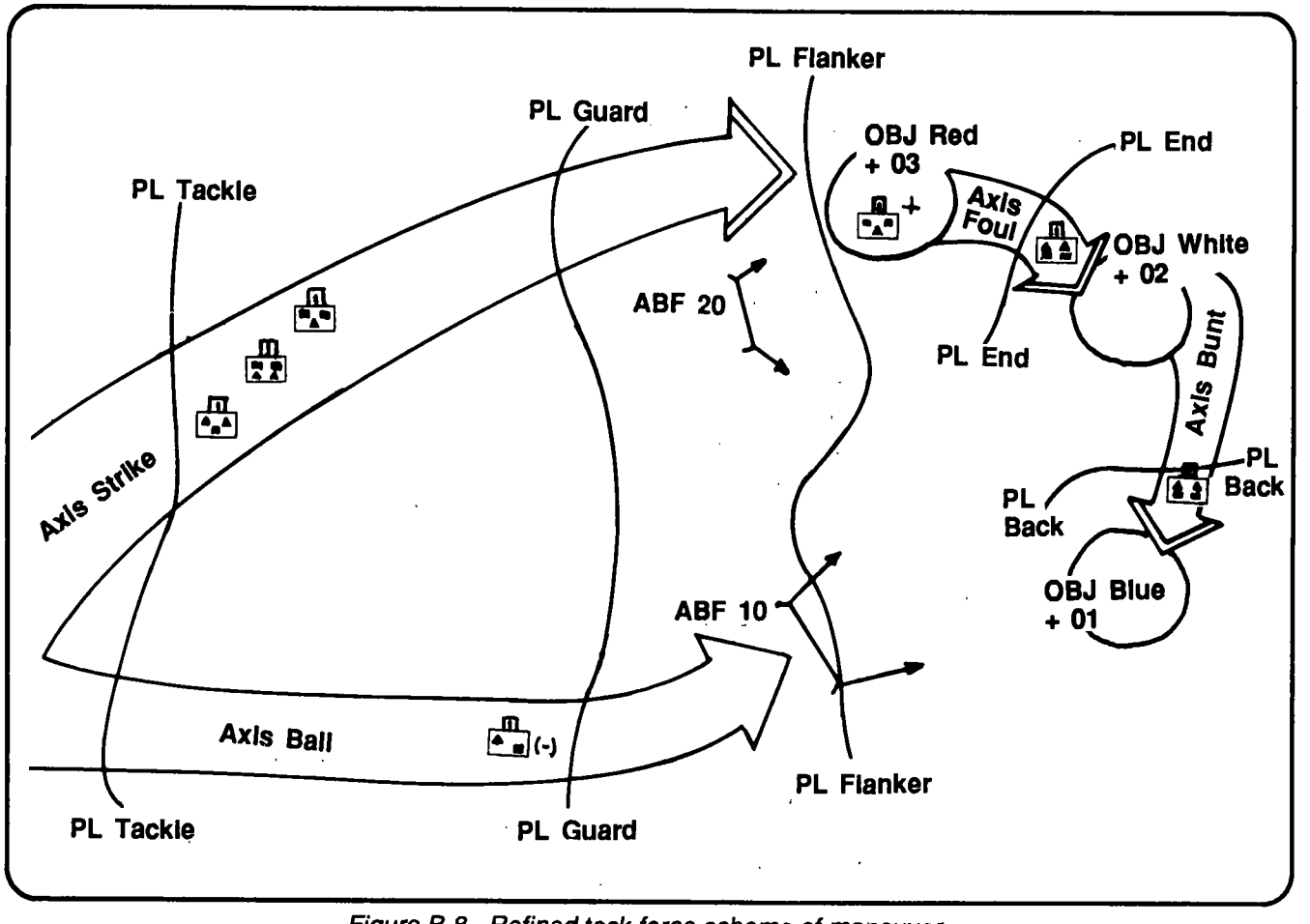


Figure B-8. Refined task force scheme of maneuver.

Table B-1. Obstacle intelligence report.

Line	Item
Alpha	Date-time group (DTG) of observation
Bravo	Location
Charlie	Type of obstacle
Delta	Enemy weapon system covering obstacle (if any)
Echo	Any other information; for example — • Terrain restricts bypass • Trip wires detected • Surface-laid • Type of equipment installing obstacle

Appendix C
Obstacle Reduction Techniques

Obstacle reduction techniques described in this appendix use fielded or soon-to-be-fielded equipment. Mine rollers, track-width mine plows, M9 ACEs, and the cleared lane marking system (CLAMS) will enhance forces breaching today with MICLICs, grappling hooks, hand-emplaced explosives, bangalore torpedoes, bayonets, probes, mine detectors, earth-moving plows, hand-emplaced minefield marking systems (HEMMS), and field expedient marking. Engineers and breaching equipment operators rehearse and practice these reduction techniques and apply them as part of the breaching actions of the company teams to which they are attached. These techniques are the most common, but many others are possible.

Breach forces will seldom employ only one technique against any single obstacle. A variety of techniques employed simultaneously complicates the breaching countermeasure problem for the defender and provides an additional margin for a successful breach. Attempting several simultaneous breaches also reduces the effects of covering fires, which reduces casualties and increases the probability of successfully producing a lane. Trying a technique, failing, then trying a second one is a trap that leads to defeat. However, when explosive techniques are employed, the breacher must be sure that dismounted engineers or infantry using other techniques are clear of the area.

MOUNTED EXPLOSIVE TECHNIQUES

Mounted explosive techniques allow the attacker to quickly breach an obstacle in minimal time and with minimal risk to personnel and equipment. The MICLIC and CEV are the primary tools for mounted-explosive obstacle reduction. However, the commander must understand the limitations of these techniques and their tactical impact. While they provide a quick breach, these assets are only effective against certain types of obstacles. The lane size and reliability may also vary greatly.

Mine-Clearing Line Charge

The MICLIC is a rocket-propelled, explosive line charge used primarily to reduce minefields containing single-pulse, pressure-activated AT mines and mechanically activated AP mines. It clears a path 100 meters long by 14 meters wide. Within this path, all pressure-activated mines will be destroyed, with the exception of some deeply buried mines along a narrow "skip zone." Mines containing magnetic or other nonpressure-sensitive fuses may escape destruction from overpressure but will usually be uncovered and blown sideways out of the lane. The MICLIC may have reduced effectiveness if employed across broken or wooded terrain. After it has been fired, the MICLIC leaves an obvious rut along the center of the cleared path.

The MICLIC can be initiated from within the towing vehicle without exposing soldiers and has a 62-meter stand-off distance from launcher to detonation point. It is mounted on a rubber-tired trailer and may be towed into position by a fighting vehicle or other prime mover. The towing vehicle must be identified well before the mission rehearsals and dedicated to that task. The vehicle operator must train to proficiency in preparing and deploying the MICLIC. This includes critical skills such as estimating the 62-meter stand-off and driving his vehicle to correctly aim the charge. The MICLIC launcher can be reloaded in 20 minutes by an experienced crew. The launcher and the towing vehicle must move to a reload point after firing the first MICLIC. Equipment capable of lifting the loaded demolition charge container, which weighs about 2,500 pounds (1,134 kilograms), must be available at the reload site. MICLICs have also been mounted and fired from AVLB decks, with the bridge down loaded, and from the beds of transport vehicles.

The MICLIC is designed to detonate mines along a 14-meter-wide path (see *Figure C-1, page C-2*). However, testing has shown that some mines located from .75 to 1.5 meters either side of the charge may not detonate. Within this zone, the MICLIC detonates 92 to 95 percent of mines that are surface-laid or buried up to 1 inch. Mines buried deeper are less likely to detonate. Proofing vehicles will eliminate any mines in the skip zone by keeping the center of the vehicle over the cleared path centerline.

The number of MICLICs needed to clear a single lane through a minefield depends directly on the minefield depth. Minefields greater than 100 meters deep require two or more MICLICs; minefields less than 100 meters require only one. As discussed in *Appendix A*, Soviet minefields can be from 60 to 120 meters deep.

However, the exact limits and depth of an enemy minefield are seldom known prior to the breach. This is particularly true when the situation is unclear and the minefield is encountered simultaneously with enemy contact. The first and only indication that the unit is in a minefield may be when a vehicle encounters a mine. The leading edge of the minefield still may be uncertain, since the vehicle could have hit a mine in an interior row. Therefore, there are two basic drills for MICLIC employment: Deploy a MICLIC to Breach a

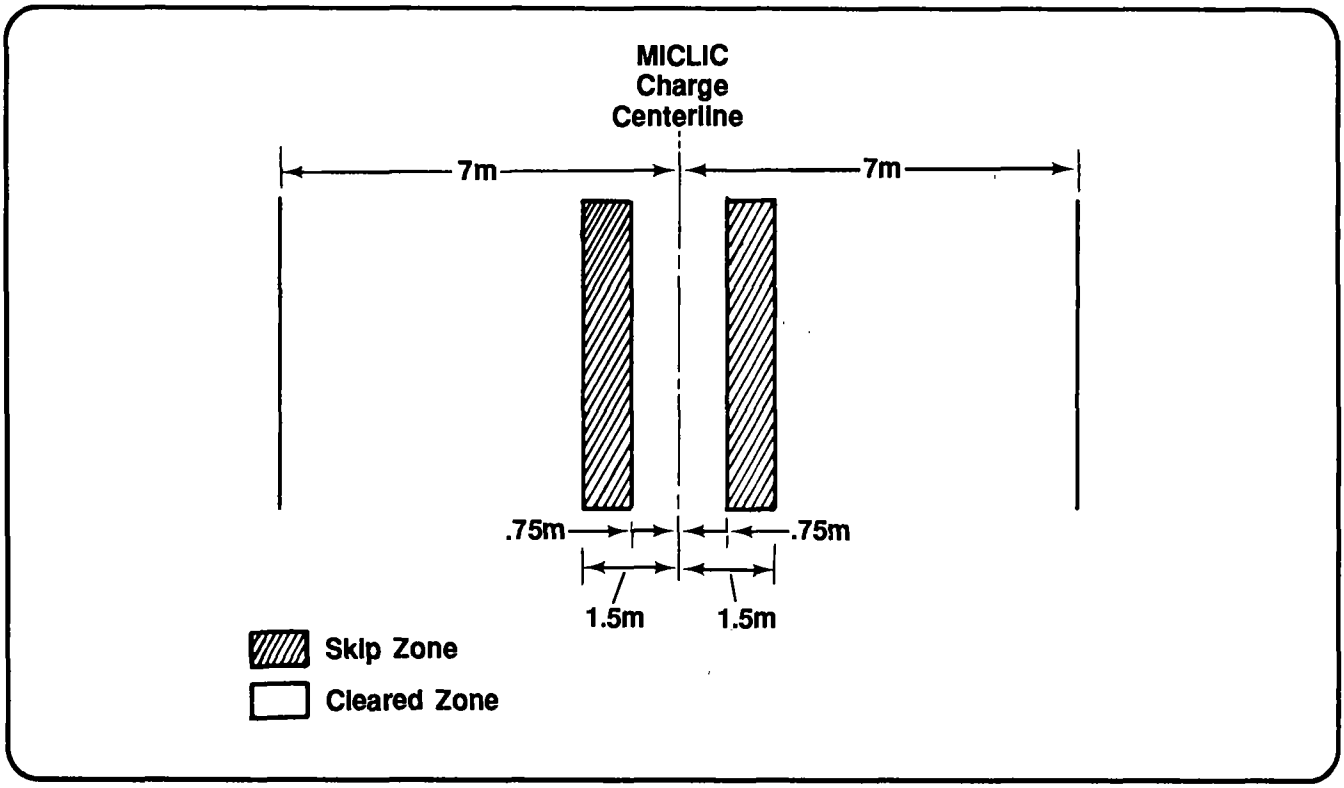


Figure C-1. MICLIC skip zones.

Minefield Less than 100 Meters Deep, and Deploy a MICLIC to Breach a Minefield of Uncertain Depth or Greater than 100 Meters.

Clearing a lane through a minefield less than 100 meters deep requires one MICLIC (see *Figure C-2*). If time permits, the leading edge of the minefield is identified and confirmed by reconnaissance. The MICLIC is deployed from a minimum standoff distance of 62 meters from the leading edge of the minefield. This distance is necessary to allow for the 62 meters of inert line charge and maximizes the amount of actual charge in the minefield.

Clearing a lane through a minefield of uncertain depth or greater than 100 meters requires two or more MICLICs (see *Figure C-3, page C-4*). The first MICLIC is deployed 100 meters from the identified leading edge or stricken vehicle (if no leading edge can be identified). Once the first MICLIC is detonated, a second MICLIC moves 25 meters into the path formed by the first and fires its charge. This extends the lane an additional 87 meters. Additional MICLICs are used for minefields of extreme depth, and each one moves down the lane 25 meters into the path created by the previous charge.

Combat Engineer Vehicle 165-Millimeter Demolition Gun

The CEV 165-millimeter demolition gun fires a large high-explosive plastic (HEP) round to a range of 925 meters. The round contains a "squashable" plastic explosive and employs a base-mounted fuse that it detonates on impact against hard targets. It is designed to be particularly effective against concrete obstacles and masonry buildings. However, it is also effective against armored vehicles, bunkers, bridge abutments, and earthen embankments. It is the most useful breaching device in the force against nonexplosive obstacles and dug-in defenders.

The demolition gun is normally used well within its maximum effective range. Rapid adjustment of fire is possible because of the slow velocity of the projectile. Generally, the gunner has relayed the reloaded gun on the target before the projectile impacts, allowing a rapid-following shot using burst-on-target techniques. The CEV commander assesses the number of rounds required to destroy the target before he engages. As a rule, two shots are fired for effect against a target unless the commander observes target destruction and commands that firing cease. Normally, the CEV will not fire more than three rounds from one position (approximately a 45-second engagement). The vehicle driver will automatically move the vehicle to a preselected supplemental firing position after the second round is fired unless he hears "adjust fire"; in which case, he waits until after the third round.

The objective of 165-millimeter fire against concrete or masonry obstacles is to break up the material sufficiently so the CEV blade can move it out of the way. If the concrete is

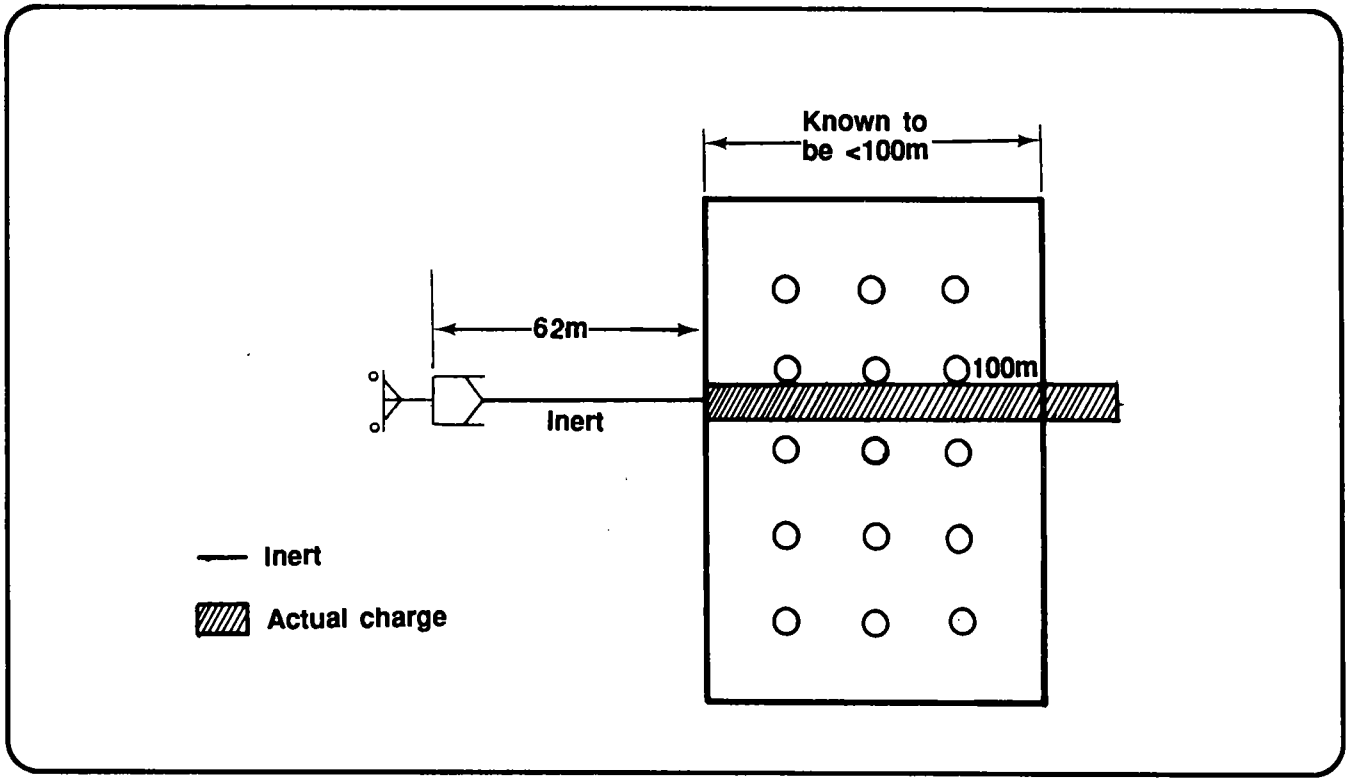


Figure C-2. MICLIC employment of a minefield less than 100 meters deep.

heavily reinforced, the steel rebar will remain. If the rebar must be removed, the CEV fires additional 165-millimeter rounds at it. If this is unsuccessful, dismounted engineers use steel-cutting charges against it. If obstacles or fighting positions are constructed of rock, the HEP explosive will shatter, dislodge, and destroy it. When defensive positions are tunneled into mountains, firing above the openings will cause the rock to break and block entrances and firing ports.

The CEV attacks concrete and masonry buildings by first firing against a corner near ground level to destroy the main structural member and to strip away outer walls in order to reveal adjacent supporting structures. Then it fires against each in sequence until the building falls. The CEV can also blow entrance holes in building walls to allow assault forces to bypass obstacles and fire sacks. Firing repeatedly into the same hole can punch through several interior walls and eliminate ground floor defenders.

HEP will destroy urban roadblocks constructed of rubble or vehicles. Generally, several shots are required to break up the roadblock sufficiently so that the CEV can blade the remainder out of the way. The HEP fire will also detonate mines placed under or within the roadblock.

Even though 165-millimeter HEP ammunition is not designed for earthmoving, it is still effective because of the amount of explosive in each round. The CEV fires at the far side tank ditch wall before attempting to breach with its blade. Several rounds of HEP will cause the far side earth to slump into the ditch, making the blade work much easier. Firing at a log crib dislodges much of the interior earth and breaks the supporting log structure. The HEP round is particularly effective against bunkers and crew-served weapons positions.

The CEV 165-millimeter gun should fire at all obstacles more complex than a simple minefield or an AT ditch. The shock wave will clear AP mines and break up the obstacle structure, making other breaching techniques easier. The CEV 165-millimeter gun is particularly effective against abatis and wire obstacles, since it breaks up the obstacle so the CEV blade can quickly remove the remainder.

The final use of the 165-millimeter gun is in the assault of a defensive position. The CEV occupies an overwatch position along with other direct-fire weapons. Normally, the engineer leaders with the assault force direct CEV fire with a predesignated color of smoke from their grenade launchers. The CEV fires on dug-in fighting vehicles and crew-served weapons positions. The HEP round will destroy any tank or armored vehicle it hits.

CAUTION

The HEP explosion creates a missile hazard within 1 kilometer from the point of detonation. Soldiers within 100 meters of the point of impact must be behind cover.

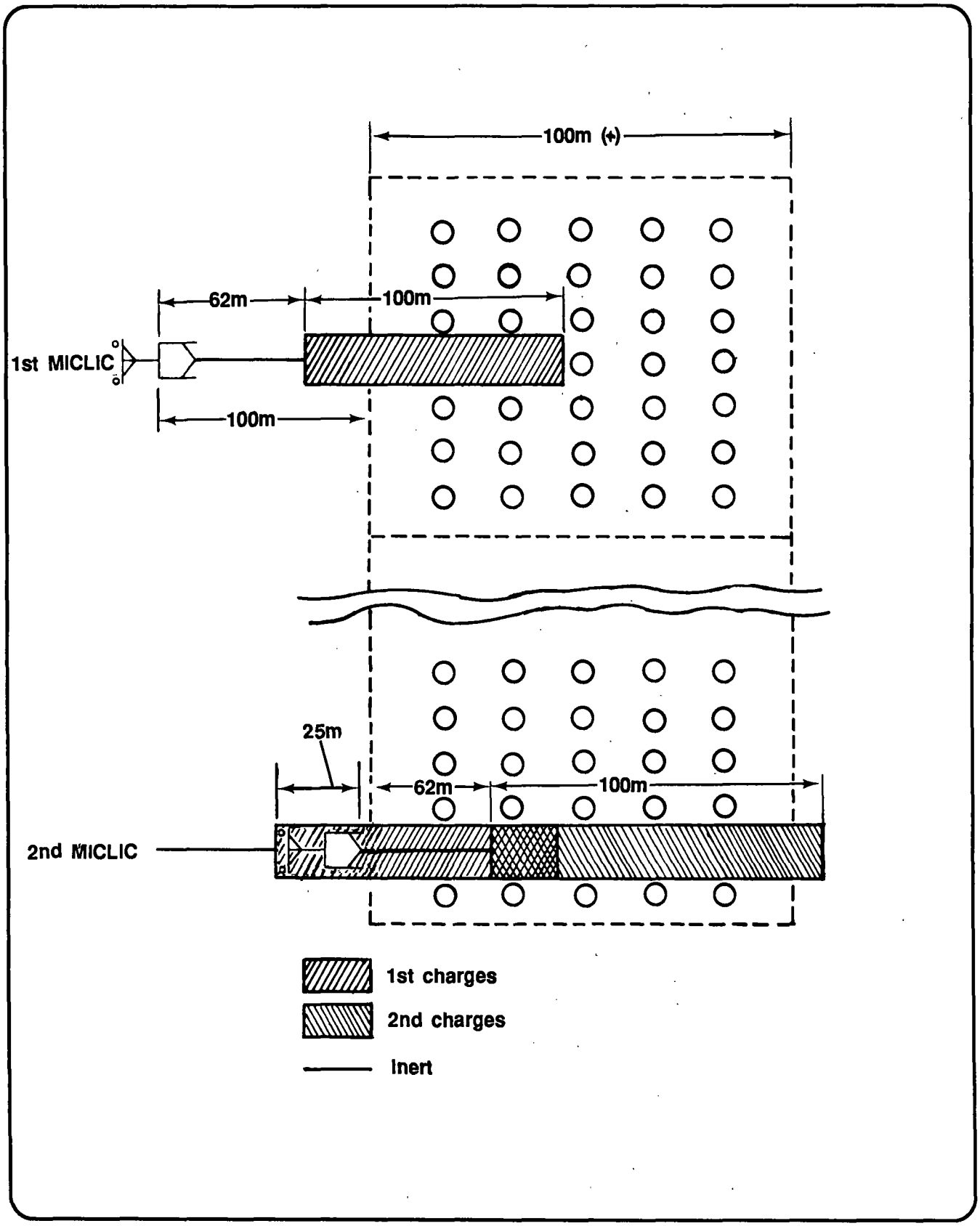


Figure C-3. MICLIC employment of a minefield of uncertain depth or greater than 100 meters.

Direct Fire

When the CEV 165-millimeter demolition gun is not available, forces can use tank and BIFV main-gun fire to reduce bunkers and urban targets. Main-gun, BIFV chain-gun, and machine-gun fires may also be used to displace or destroy surface-laid mines. The nature of tank ammunition makes it far less effective against obstacles. If available, direct fire from 155-millimeter artillery is almost as effective as 165-millimeter CEV fire.

Blade-Placed Antitank Wall Charges

The blade of an ACE, CEV, M88, or bulldozer can carry a large explosive charge of up to 1,000 pounds to an AT wall or other vertical-faced obstruction and drop it off against the face. The frame that carries the charge is built of lumber or small angle irons and channels. The frame consists of a rack for the explosives and a supporting structure that hooks over the dozer blade. The supporting structure has legs to hold the rack up against the wall, shoes to prevent the legs from sinking into the ground, and support arms which hold the rack and hook over the dozer blade. The surface area of the shoes and the length of the legs may be adjusted to meet local soil conditions and specific obstacle requirements. The carrier must be built to fit the specific blade to be employed. *Figure C-4, page C-6*, illustrates typical rack dimensions. *Figure C-5 , page C-7*, shows the rack mounted on a CEV blade.

To breach a 6-foot-thick wall, the blade must carry an explosive charge weighing 1,000 pounds. The dimensions of the charge must be 9.5 feet long, 22 inches high, and 8 inches thick, and it must be placed about 2 feet from the ground. Leaning the charge against the wall will provide adequate contact for most vertical and sloping walls (see *Figure C-6, page C-7*).

The rack and charges are prepared in an assembly area. The blade carries the rack hooked over the top of the raised blade. The rack is emplaced by lowering the blade until the hooks are clear. The rack is then pushed against the wall. The charges, 18-pound packs of C4 or 20-pound TNT blocks, are loaded into the frame and lashed to the frame supports with rope or cord. Thin sticks are lashed to the top of the frame to indicate when the operator should drop the frame and lean the rack into the wall. These sticks should protrude 1.5 to 2 feet in front of the frame. The charge is primed with an electric priming system connected to no less than 75 meters of electric cable and a detonator in the carrying vehicle. Carrying the charge poses a significant hazard for the crew of the carrying vehicle. The vehicle should be shielded from direct fires as much as possible.

The operator of the carrying vehicle stops when the sticks at the top of the rack touch the wall. He then lowers the blade, sets the rack on the ground, and raises the rack hooks above the top of the blade. On an uneven surface, the rack may settle unevenly, making it difficult to unhook the rack. The operator backs at least 75 meters from the charge and releases the electric firing cable as he backs. The crew, buttoned in the armored vehicle, then fires the charge. This maneuver must be well-trained and well-rehearsed.

MOUNTED MECHANICAL TECHNIQUES

Like mounted explosive techniques, mechanical techniques provide the attacking commander with a quick, responsive breaching asset. These include mine plows and rollers, engineer blades, AVLBs, fascines, CEVs, and APC grapnel. Mounted mechanical techniques give the commander more flexibility than mounted explosives, since the crew can react to the type and depth of the obstacle. However, the commander must understand the limitations of his breaching equipment (for example, a mine plow can only sustain one mine detonation).

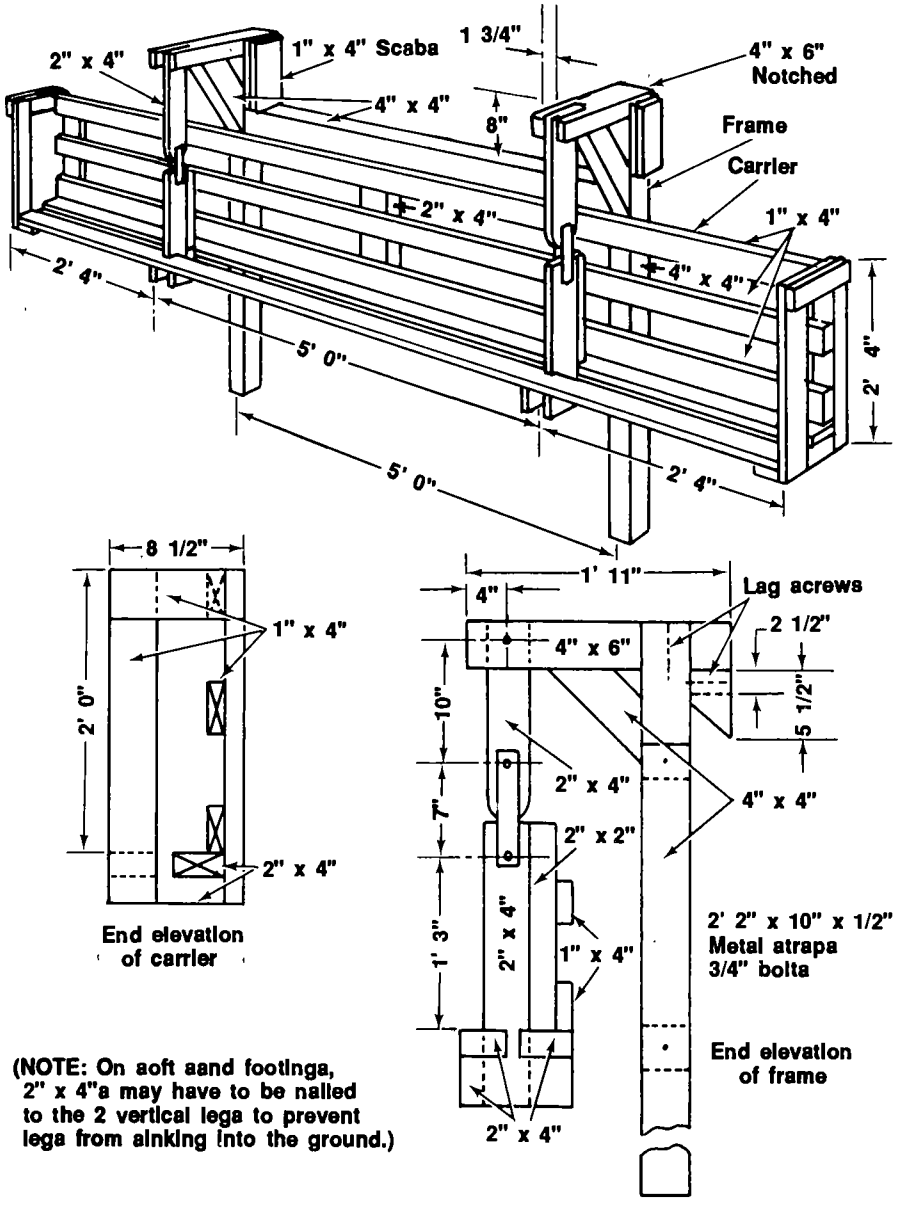
Track-Width Mine Plow and Roller

Track-width mine plows, rollers, and the CLAMS are fielded as battalion sets. They consist of three plow systems for each M1 armor company, one roller assembly per M1 company (with six roller-mounting kits provided for the armored battalion), and one CLAMS per company. Plows make lanes through minefields and rollers detect minefields and proof lanes created by other means. A roller set is not a good primary system for minefield reduction, because several mine detonations will destroy it.

Plows lift and push mines that are surface-laid or buried up to 6 inches deep to the side of the track-width lanes. The plow creates a 68-inch cleared path in front of each track (see *Figure C-7*, page C-7). The float assembly for each plow will exert enough pressure to activate most single-pulse mines. This effectively clears a section of the centerline by explosive detonation, but it may disable the plow. A "dog bone" and chain assembly between the plows will defeat tilt-rod, fused mines. Mines not lifted and moved by the plow will not be defeated. Mines armed with antihandling devices, antidisturbance devices, or seismic fuses may detonate when lifted by the plow and may disable the plow. Mines lifted by the plow are left in the spoil on each side of the furrowed path and remain a hazard until removed or neutralized.

The plow can be mounted to any M1 without special preparation or modification. Since this requires lift capability and takes up to an hour, it must be mounted well in advance of the mission. It cannot be easily mounted or transferred to another tank under battlefield conditions. The 3-ton plow will only provide a minor reduction on the tank's maneuverability and speed; however, it will prevent the tank from climbing up a vertical step. It will affect the employment of weapons systems only when the plow is in operation.

When plowing, the M1 is restricted to a speed of less than 10 kilometers per hour (depending on soil conditions). Although the plow has an emergency disconnect, the tank



Quantity			Item
4 pieces	1" x 4"	12'	1 x 4 S4S
4 pieces	2" x 4"	10'	2 x 4 S4S
2 pieces	4" x 4"	12'	4 x 4 S4S
1 piece	4" x 6"	4'	4 x 6 S4S
8 each	1/2"	7'	Lag screws
4 each	3/4"	3"	Bolts
2 each	3/4"	6"	Bolts
4 each	1/8" x 2"	10"	Metal straps
			Assorted nails

Figure C-4. Blade charge rack dimensions and materials list.

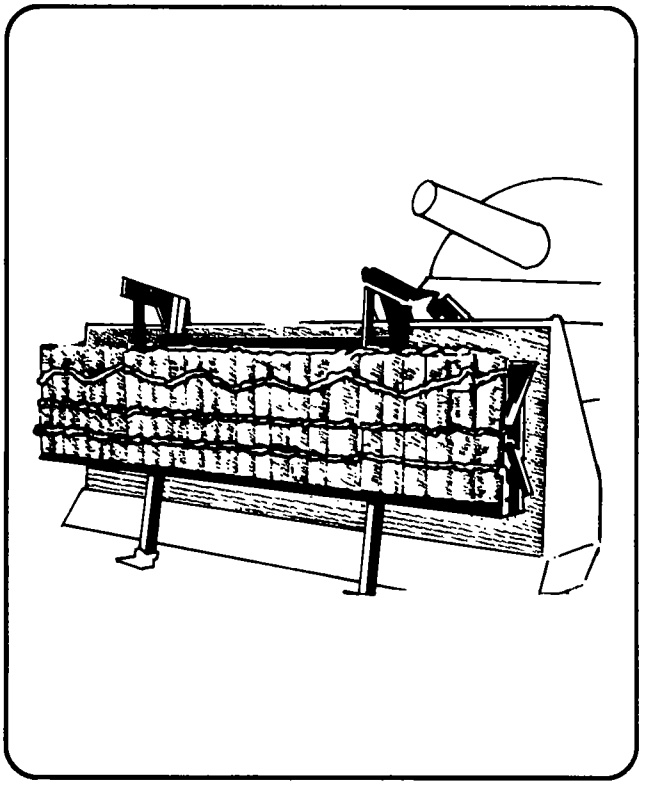


Figure C-5. Charge rack loaded on a CEV blade.

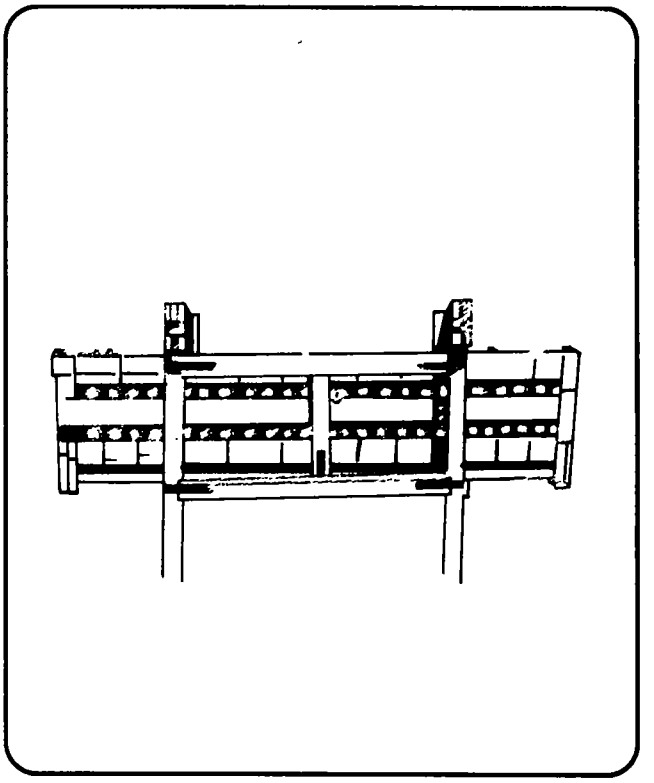


Figure C-6. Charge placed against a wall.

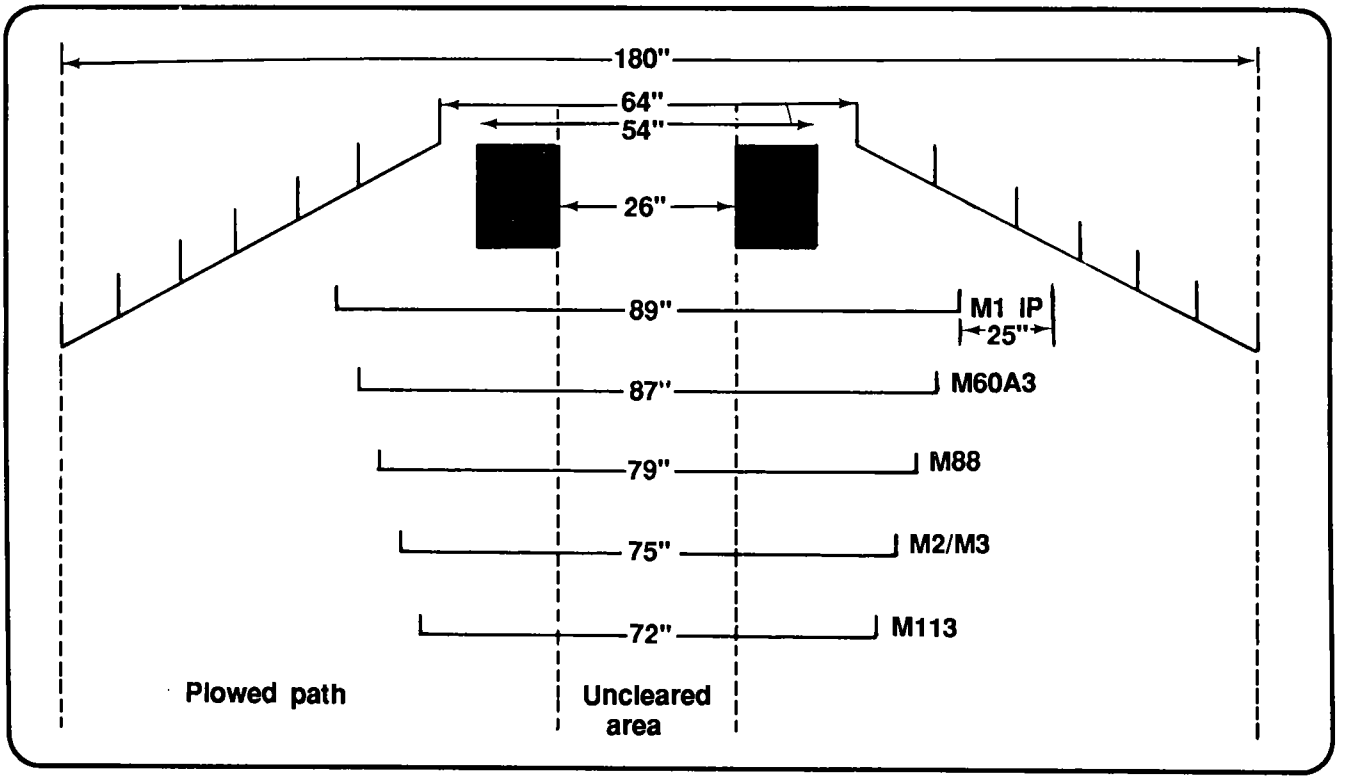


Figure C-7. Mine plow width compared to track vehicle widths.

cannot maneuver when it is plowing and must continue on a straight course through the minefield to prevent damage to the plow. When the tank is plowing, the main gun must be traversed to the side, since a mine detonating under the plow may throw it violently into the air and damage the gun tube. The area selected for the lane must be relatively flat and free of rocks or other obstructions.

The operator should begin plowing about 100 meters from the estimated leading edge of the minefield and 100 meters beyond the estimated far edge. This ensures that the lane extends through the entire minefield. A second plow should not replow the lane, since any deviation from the first plowed path will push nontilt-rod mines from the lane centerline into the track-width lane created by the first plow.

Rollers are designed to detect minefields. The roller sweeps a 44-inch path in front of each track (see *Figure C-8*). A "dog bone" and chain assembly between the rollers defeats tilt-rod fused mines. Magnetically fused mines will not be defeated unless activated or crushed by the roller. The roller is designed to withstand about two explosions without damage; however, this depends on the amount of explosive material in the mine. Large blasts may destroy the roller and vehicle or injure the crew.

The roller can only be mounted on M1 tanks modified with the permanent attachment of the mine-roller mounting kit. Each armored battalion will have six modified tanks. As with the plow, attachment of the roller to the tank is a cumbersome, time-consuming operation and difficult under battlefield conditions. It requires a lift capability to mount. The roller weighs more than 10 tons and has a great impact on the tank's maneuverability and speed (limiting it to 5 to 15 kilometers per hour). The mounting kit itself has a minimal effect on the vehicle's operational capabilities.

Normally, the roller is carried by a tractor trailer. It may move with the combat trains or farther forward if the roller is needed. Planning for its movement and designating an assault position for mounting the roller on the tank is critical if it is to be employed effectively.

When it is employed, the roller tank must travel in a relatively straight path, since tight turns may cause the rollers to deviate from the path of the tracks and miss mines. Ground fluctuations, bumps, and berms may cause the rollers to lift from the ground and miss mines. The roller-equipped tank cannot negotiate gaps on its own. It cannot cross the AVLB, because it exceeds the weight capacity of the bridge and will severely damage curbs and paneling. The main gun must be traversed to the rear or side for a mine encounter, since a mine blast will throw the roller or parts of the roller violently into the air and may damage the tube.

The mine roller is a minefield detection system. It is most effectively deployed to lead columns on route movement but can be used to precede tactical formations. In column movement, unit vehicles travel a narrow path and one or two mine rollers can effectively detect any mines in that path by

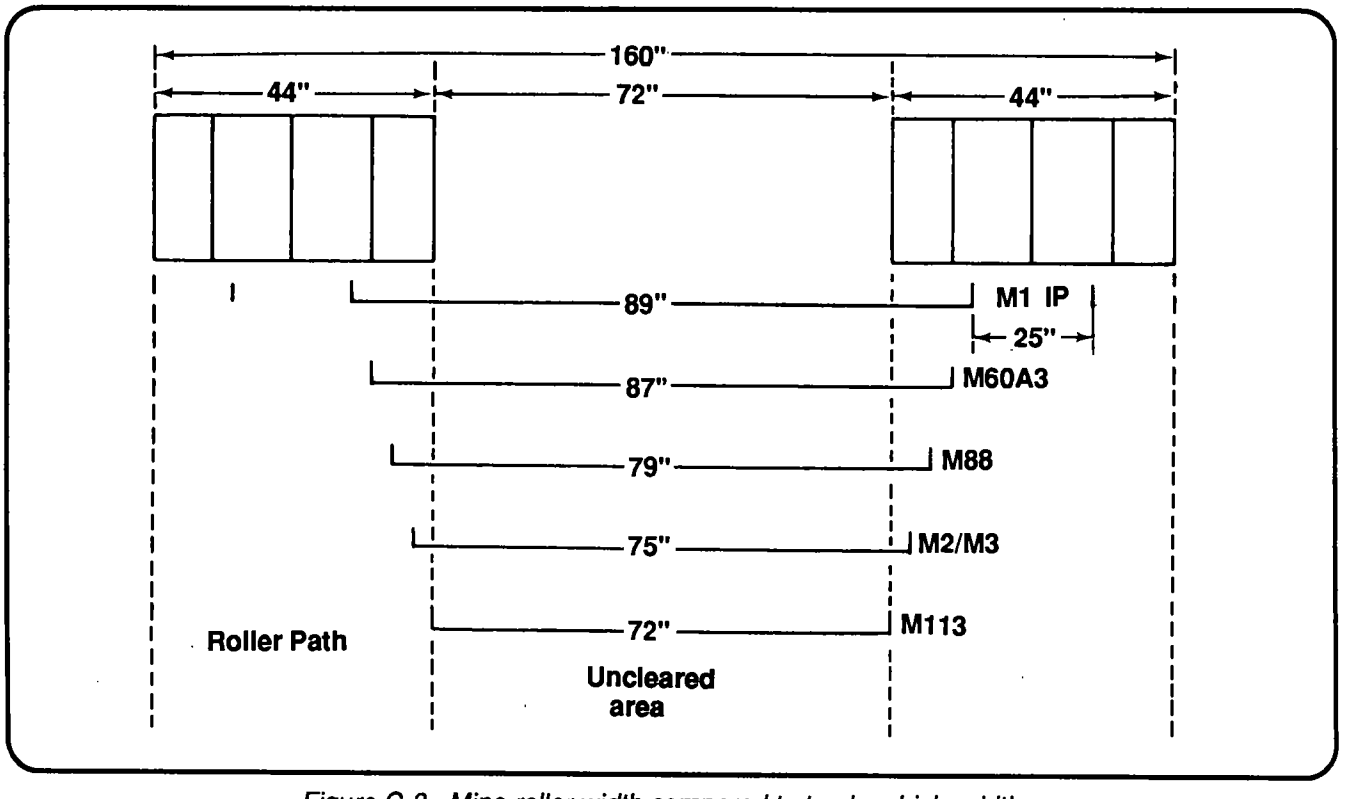


Figure C-8. Mine roller width compared to track vehicle widths.

leading the column. However, this causes the column to slow to 5 to 15 kilometers per hour.

Mine rollers can also be used to detect minefields in front of deployed tactical formations, although more than one roller tank is required for good probability of detection. A company deployed across a 500-meter front, led by one roller tank, has less than a 40-percent probability of detecting a standard Soviet minefield with the roller. Two roller tanks increase this probability to approximately 80 percent, and three virtually guarantee detection. The attacking TF must mass roller tanks on the key axis if it is to employ them as minefield detectors. The mine rollers move several hundred meters in front of the unit's main body under continuous overwatching fires from bounding company teams. If a roller tank detects a mine or is fired upon, the roller tanks immediately launch smoke grenades and seek cover. If cover is not available, they breach with their rollers, ejecting markers from their CLAMS. Overwatching company teams must begin immediate suppression of all observed and suspected positions.

Minefield detection with rollers slows units considerably. There are two instances when the loss in maneuverability can be worthwhile. They are when the threat template indicates the presence of minefields but the exact location is unknown; or when an enemy strongpoint is detected and the tactical obstacles shaping the fire sack have not been found.

Mine rollers can be used to breach or proof lanes through harassment mines and low-density minefields along roads or trails. This role is similar to route-clearing operations conducted in Vietnam.

Rollers may be employed in deliberate breaching operations to detect predicted but undiscovered minefields. Standard Threat mine spacing does not provide a 100-percent probability of mine encounter by one roller system, so rollers must be employed in pairs. Generally, the two roller tanks will be spaced about 100 meters apart and covered by overwatching units using bounding movement. Sufficient overwatching direct fire should be employed to effectively suppress enemy fires. When a roller tank encounters a mine, it continues until it reaches a covered hiding position. The force then employs deliberate breaching techniques to force the obstacle. Roller tanks employed in this manner normally act during the firing of an artillery preparation on the defending positions.

Rollers can be used to proof lanes in obstacles breached by other means such as MICLICs or mine plows. A roller pulling a trailer-mounted MICLIC can be deployed to proof the lane created by a MICLIC from another vehicle. The roller then fires the second MICLIC and proofs its own lane.

A second roller can overlap to cover most of the dead space unrolled by the first tank. This technique is not to be used when proofing lanes created by plows, since the overlapping roller will encounter all of the mines in the spoil next to the plow-furrowed track lane. Overlapped rolling also makes lane negotiation easier for vehicles such as M113s, which have little margin for error when following the proofed lanes of a single roller.

If rollers are designed to participate in a deliberate breach operation, or if the force chooses to incorporate rollers into in-stride breach plans, they must be mounted before mission rehearsals. If rollers are left unmounted, they are carried in the TF formation on M916 tractor trailers. The rollers will require lift capability (such as an M88), a secure location, and 30 to 60 minutes to mount on a tank fitted with the mounting kit.

The plows and roller systems can be stopped by gaps in or in front of the minefield. A MICLIC fired over a gap can break down berms and embankments of the gap. However, plows and rollers must wait until a blade (such as the ACE or CEV) fills the gap before they can pass. The plow tank can cross a gap on an AVLB, but roller tanks will exceed the bridge capacity and severely damage bridge panels and curbing.

Engineer Blades (M9 ACE, CEV, Dozer)

Blades are ideally suited to break down and reduce earthen gaps such as AT ditches and road craters. Normally, the primary blade vehicle for a breach is the CEV. The ACE and the bulldozer are used in the deliberate breach after indirect fires have been eliminated; however, either of them can be used wherever they are needed.

The blade fills a gap or tank ditch by starting its push from far back. It takes shallow cuts, pushing the earth forward into the gap until the hole is sufficiently filled to make a passage. The blade improves the breach by pushing material back from the far side. Firing the CEV 165-millimeter demolition gun into the far side of a gap can dislodge earth and speed the reduction. If the blade must make a passage through urban rubble, it is sometimes faster to push an earthen ramp over the rubble than to remove it.

The blade is effective against wire. It is important to remove the pickets supporting the wire with the blade, then breaking the wire is simple. Before blading through a wire obstacle, the engineers should check for mines. If this is not possible, the blade should be set to skim to remove wire and mines.

Abatis and log cribs are special problems for blades. They are designed to be very difficult to push out of the way. Normally, explosives are used on the forward face of a log crib before the blade pushes the rubble aside. This demolition effort can be accomplished with satchel or cratering charges or with the CEV 165-millimeter demolition gun. The same is true of an abatis. Before the blade can be effective, abatis must be loosened up with explosives, winches, or cables, or by dismounted engineers using chain saws.

The engineer blades on the M9 ACE, CEV, and bulldozers were not designed for breaching minefields. They can be employed as a last resort, but this is extremely dangerous to the equipment and its crew. The blades are used to skim when removing surface and shallowly buried mines. It is easy for mines to roll under the blade during this process, particularly if the surface is irregular. Mines also float in the spoil in front of the blade, and as the spoil rolls it may detonate the mines. The operator should use a curved path or herringbone skimming technique. He makes multiple overlapping passes, stripping away about 6 inches of soil each time (see *Figure C-9*). The operator should skim for no more than 15 meters at a time. This prevents excessive spoil from building up in front of the blade.

The bulldozer exposes the operator to AP mines. If used, the operator's cabin should be sandbagged or reinforced with a steel plate, and the lane should be cleared of trip wires with grappling hooks.

Armored Vehicle-Launched Bridge

The AVLB is an engineer asset with quick bridging capability (up to 18 meters) for military load class (MLC) 60. For MLC 70, it can span 15 meters. The AVLB is not the first choice for breaching a gap during the in-stride breach, because it is slow and generally moves a terrain feature to the rear to avoid attracting fires. During the launch, the AVLB presents a high profile and can extend above screening smoke to reveal the breaching location. The bridge can be recovered from the far bank and employed again. The AVLB can be used to overlay an understrength bridge, but it must be cribbed to avoid placing any load on the bridge. It can also be placed on a stream bottom to provide a fording capability over soft or rocky material, but this can cause severe damage to the bridge. The mine roller cannot cross the AVLB without doing extensive damage to the curbing. It takes about 5 minutes to deploy the AVLB.

Fascines

Fascines are large cylindrical bundles of material (usually wood poles, plastic pipes, or metal pipes) loosely bound together and placed singly or in groups in gaps to create a lane. The material must have enough width and load-bearing capacity to handle the crossing traffic. British engineer armored vehicles often mount fascines to any armored vehicle using cable, rope, or mounting kits. Fascine bundles can be carried on the rear deck of the CEV. The CEV boom remains in its stowed position, with the fascine bundle over the rear deck. To employ the fascines, the CEV pulls up parallel to the gap, swings the fascines over the side by rotating the turret, and releases the cable holding them. Fascines can be carried on pole trailers and low-bed trailers to an attack position, where they are loaded onto the CEV.

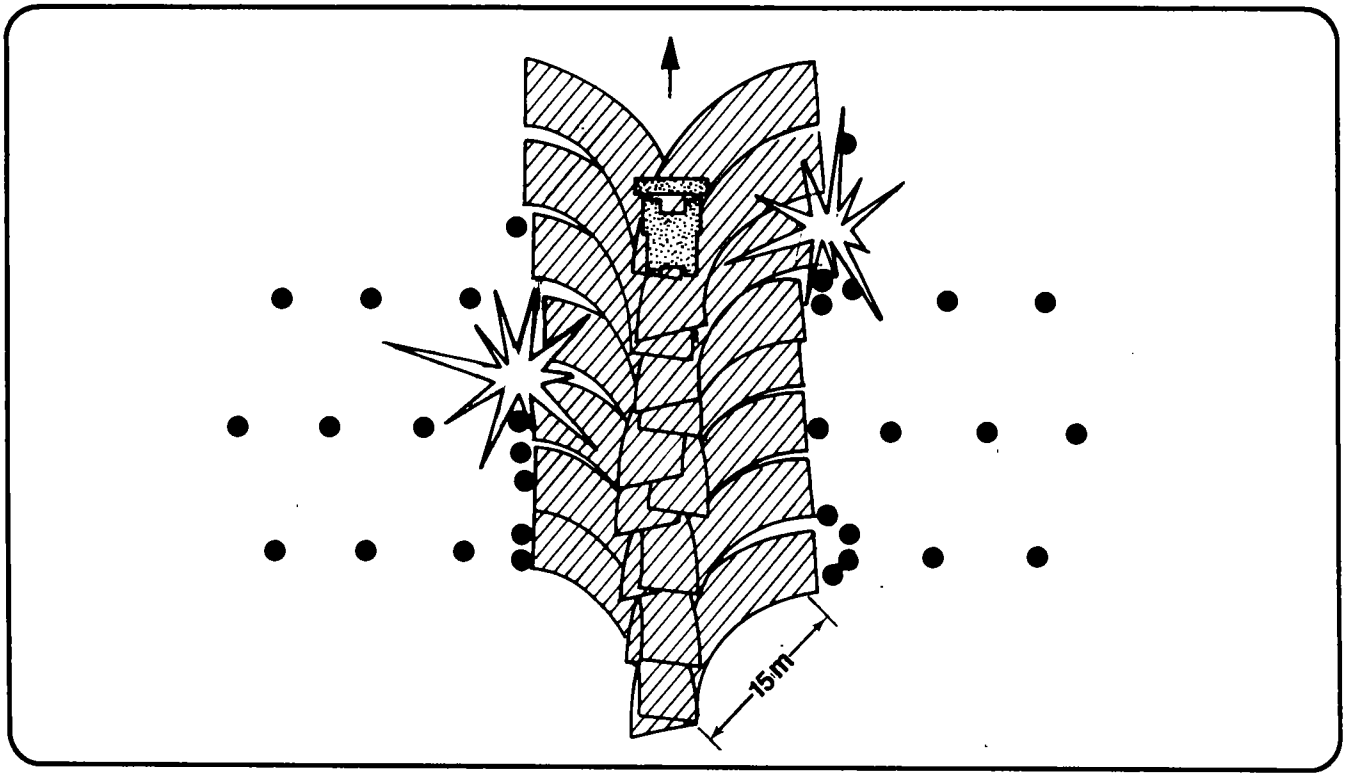


Figure C-9. Engineer blade skim pattern.

CEV Boom and Winch

The boom on the CEV deploys a winch cable like a small crane. It rotates with the turret and is used as a lifting device in breaching operations. If a CEV is not available, the boom on the M88 can be used. It is designed to lift materials but does not rotate. The M88 boom can remove disabled vehicles and rubble that cannot be bladed out of the way. It is a critical device whenever the obstacle must be reduced by either pulling or lifting. The CEV carries wire rope and four-part slings with hooks in its bustle rack to allow rapid rigging of material to be moved. It also carries a logging chain, which can be used to assist with lifting or pulling material out of the way.

The CEV boom is particularly useful for reducing an abatis. When the abatis is constructed, the trees are dropped facing the attacker and are overlapped so that pushing them with the blade simply makes them interlock more and makes the obstacle more difficult. The abatis must be pulled apart toward the attacker. The CEV uses its cable and boom to pull the trees out of the way. The cable can be attached to log carriers or log chains to speed connection to trees. A second technique is for dismounted engineers to carry the cable deep into the abatis and saw off a large section of a tree trunk with chain saws. The cable is then connected to the section and the CEV pulls the log, spreading the abatis trees to the side. The abatis can also be dismantled by cutting trees from their stumps and lifting each out of the way with the boom while working through the obstacle.

The CEV boom can also be used to breach wire obstacles. A large grapnel is constructed out of angle iron or bar stock and is connected to the winch cable. The grapnel is pitched into the wire by rotating the turret while releasing the winch. The wire is lifted as high as possible and the CEV backs up to pull it out of place.

The CEV boom can carry an H-frame made from M4T6 bridging or from any other available material which can span a gap or be dropped over wire. If mines are suspected under the wire, dropping the H-frame will either detonate them or allow safe passage by dismounted assault forces or engineers. The H-frame will allow rapid passage of a gap by dismounted assault forces and can quickly be converted into a bridge by engineers.

The CEV boom can carry fascines, but these are normally carried on the rear deck and swung to the side with the boom stowed. It can also carry a suspended charge that is dropped into the gap to destroy the near side so the CEV blade can complete the breach. It is critical for reloading MICLIC launchers.

Armored Personnel Carrier (APC) Grapnel

If wire obstacles contain AT mines, it is preferable to drag the wire out of the way rather than run a blade through it. A simple grapnel can be fabricated out of welded angle iron or bar stock and fastened to a length of wire rope (preferably 1/2 inch) as a grapnel. This wire rope is fastened to a lifting eye on the top of an APC or some other strong fastener on any armored vehicle. The vehicle is driven to the wire and the crew throws or places the hook into the wire next to a picket. The vehicle then backs away, stretching and breaking the wire. After the wire is pulled out, the breach must be checked for buried mines. The grappling crew must be buttoned up during the drill in case they detonate a bounding AP mine. Every engineer APC carries one of these grapnels.

DISMOUNTED TECHNIQUES

Manual reduction techniques provide a backup to mechanical systems. Manual obstacle reduction is also the only method capable of solving any breaching problem regardless of situations and conditions. However, this method requires more breaching element time and breach force protection. Some types of terrain, weather, and sophisticated fuses can severely degrade the effectiveness of rollers, plows, and line charges. A clever opponent can capitalize on equipment limitations by designing an obstacle to defeat our standard breaching devices. Dismounted soldiers are capable of analyzing and solving a variety of problems in a far more flexible manner than with mounted equipment. Engineers reducing obstacles manually use hand-tools, hand-emplaced explosives, grapnel hooks, ropes, ladders, timbers, probes, mine detectors, and a variety of expedient materials.

The manual techniques, often called "manual breach battle drills" by the engineers who use them, must be extremely well practiced. Soldiers in the demolitions team are assigned special tasks such as lane marking, firing system construction, or demolitions placement. Each task is thoroughly rehearsed for the assigned soldier. All engineers in the team are cross trained on all tasks involved in the breach. Demolitions are prepared well before arrival at the breaching site. The platoon must rehearse the reduction technique until execution is flawless. During the breach, the engineer platoon will be exposed in the lane for 5 to 30 minutes or more, depending on the mission and the engineers' level of training.

Manual Reduction of Surface-Laid Minefields

The Soviets possess a significant mechanical mine-burying capability. They also hand-bury mines; however, they often surface-lay them for speed and to facilitate later recovery. A surface minefield does not normally include AP mines, so trip wires are not a problem. Buried mines will usually be found in a prepared defense requiring a deliberate breaching operation. When the reduction team does find buried mines, they should assume that antihandling devices and trip wires are present until they prove otherwise.

When the obstacle consists of surface-laid mines, a manual reduction technique is probably the most effective. Generally, there are no AP mines and covering fires are predominately AT fires. Using 3- to 5-second rushes, the demolition team moves quickly through the minefield. The team takes advantage of folds in the ground for cover, placing blocks of explosives on mines within the lane. They also emplace lane markers as they traverse the minefield. The final member of the demolitions team completes a line main attached to all explosive blocks and detonates the system. After the mines are blown, the team makes a visual check to make sure all mines are cleared before directing traffic through the lane. This technique should reduce a standard 120-meter-deep minefield in 5 minutes from the time the demolition team breaks cover and begins.

In a variation of this technique, blocks of explosives are preprimed with a 2-minute fuse. The team moves through the obstacle, lights the fuse on a single block of explosive, and sets it on a surface-laid mine. The team continues to move to the next mine and repeats the same process. This technique is faster than the line-main method. An engineer squad can make two lanes through a standard 120-meter-deep minefield in less than 3 minutes. This method has certain risks; for instance, there is a higher chance of misfire with individually primed demolitions. Possible injuries in the minefield containing initiated firing devices can defeat the closely timed breach, and detonations occurring at different times can dislodge charges next to other mines. Use this technique only when speed and the mission necessitate such risks.

Manual Reduction of Buried Minefields

Manually reducing a buried minefield is extremely difficult. If mine burrows are not easily seen, mine detectors and probes must be used to locate the mines. The mines are then destroyed by hand-emplaced charges using the same techniques as those used with surface-laid mines.

Grappling Hook (Grapnel)

The grappling hook is a multipurpose tool that can be used in manual obstacle reduction. Soldiers use this device to detonate mines from a standoff position by activating trip wires and antihandling devices. After the grappling hook is used to clear the trip wires in a lane, dismounted engineers can move through the minefield and visually locate and prepare surface-laid mines for demolition. In buried minefields, soldiers first grapple and then enter the minefield with mine detectors and probes. This is a very slow procedure and is only suitable for the deliberate breach after fires have been eliminated.

A length of light rope 60 meters or longer is attached to the grapnel for hand-throwing. The range for throwing the hook attached to a cord is usually no more than 25 meters. The excess rope is for standoff distance when the thrower begins grappling. The soldier tosses the hook-and-seek cover in case the impact of the grapnel and rope detonates a mine. The thrower then moves rearward, reaches the end of the excess rope, takes cover, and carefully pulls the hook toward him. After recovering the grapnel, the thrower moves forward to the original position, tosses the hook, and repeats the technique at least two more times. Then he moves to the end of the grappled area and repeats this sequence to the depth of the minefield. Multiple grapplers can clear a lane of trip wires more quickly and thoroughly, but their efforts must be simultaneous. The team must be conscious of the kill radius of the mines they are reducing. Some Soviet AP and AT mines are lethal to personnel in the open for up to 50 meters.

CAUTION

The soldier cannot physically throw the grapnel beyond the casualty radius of bounding AP mines.

A hit on a trip wire may destroy or scatter the hook and cord. Engineers using this technique must carry extra hooks and cord.

A slower but safer method of handling trip wires is to conduct a deliberate visual search for them. The soldier low crawls through the minefield parallel with the ground. This gives him the best chance of deleting trip wires. He employs a powerful flashlight, if available, to cause reflections and shadows. He can also sweep a wand with a dangling thread over the ground ahead of him and watch for the thread to be disturbed by a trip wire. When a trip wire is discovered, it is carefully followed to the mine, then destroyed with a demolition charge.

Deliberate Breach with Mine Detectors

Mine detectors are used along with probes in a deliberate breach after fire has been eliminated from the obstacle. The breaching party requires four mine detectors to sweep a single (8-meter) lane. This requires two engineer squad sapper teams, since one team is only capable of operating two detector teams simultaneously.

A detector team consists of three soldiers. The detector operator sweeps a 2-meter path, carefully observing the ground for visual indicators as he moves. Immediately behind him, his assistant also visually searches the ground for mine indicators. When the detector operator locates a suspected mine, his assistant places a breaching charge on it. The third member of the team follows with additional breaching charges and a roll of detonating cord. He lays a line main through the minefield and clips the detonating cord from each charge to the line main. The detector team carries 16 breaching charges and can expect to encounter up to three

mines in a standard minefield. The detector operator sweeps at a speed of about 10 meters per minute.

The detector teams sweep in echelon, spaced about 25 meters apart to prevent interference between detectors. Each team is careful to overlap the lane swept by the team to its front. The breach should continue for a distance of at least 150 meters past the first suspected mine location. When each detector team has passed the suspected minefield, the four line mains are connected together and the charges are detonated. The lane centerline is marked for passage.

M1A1 and M1A2 Bangalore Torpedoes

The bangalore torpedo is a hand-emplaced, explosive-filled pipe that is effective against wire obstacles and has limited effectiveness against AP mines and some AT mines. Each section of pipe is 1.5 meters long with 10 sections (a total of 15 meters) per kit.

Wire Breaching Procedures

The squad moves to the reduction site with squad members carrying bangalore torpedo sections. Wire obstacles seldom are deep enough to require the full bangalore kit. The squad can form two breach teams and breach the wire in two positions simultaneously (normally about 25 meters apart for a dismounted attack) or two obstacles in depth. Each breach team has three members and can carry five bangalore sections plus the accessories necessary to breach up to 25 feet of wire obstacles. The breach team assembles bangalore sections and pushes them under the wire, primes the torpedo with a single cap in the detonator well, and detonates the charge. Normally, the bangalore torpedo is primed non-electrically, since electrical firing systems are too complex and time consuming to use in an assault breach. Because the bangalore torpedo throws lethal fragments of wire for long distances, the breach team must ensure that all personnel within range have sought cover before the detonation.

Mine Breaching Procedures

The bangalore torpedo kit will clear a 1-meter-wide lane. Several threat and friendly mines require two impulses or a single, long impulse for detonation. The bangalore generates one short impulse. Bangalore torpedoes generally do not generate enough overpressure to detonate AT mines unless they are immediately beside or on top of them. As a last resort against AT mines, the bangalore may be placed immediately adjacent to surface-laid mines. If the mines are mechanically buried in furrows, a sapper team lays three sections along the furrow perpendicular to the direction of the lane (see *Figure C-10, page C-14*). If the mines are staggered or widely spaced, the team lays sections parallel to the direction of the lane.

Manual Antitank Ditch Breach

The dismounted sapper team from an engineer squad can quickly breach an AT ditch using hand tools and demolitions. This may be a preferred technique if the enemy has effective AT fires covering the ditch.

The team uses satchel charges preconnected to detonating cord branch lines. They dismount as close to the ditch as possible and move to the ditch using dismounted movement techniques. On arrival, the team quickly digs four holes in the side walls (two in each side) near the ditch bottom for the satchel charges. The holes should be approximately 5 feet apart in each wall and directly opposite each other. After the holes are approximately 2 feet deep, the satchel charges are placed, connected to a prefabricated ring main, and tamped with loose earth. The squad leaves the ditch, takes cover, and detonates the charges. Then they quickly cut down the remaining loose soil to allow vehicles to pass. The entire operation is conducted in 10 minutes or less.

Assault Ladders and Footpaths

Assaulting well-prepared fortifications will require the force to attack in columns of platoons through wire and mine obstacles, reinforcing trenches, and steep walls. An example of a difficult fortification to assault with dismounted troops is the desert strongpoint. This type of strongpoint uses a 3- to 5-meter-high circular berm on the desert floor. This protects the defender while he prepares necessary weapons and vehicle fighting positions. The attacking force must fight through the tactical and protective obstacles outside the berm and climb the wall to assault the weapons pits. Folding assault ladders constructed from metal or wood can be carried on armored vehicles or by soldiers. *Figure C-11, page C-14*, shows an example of a steel folding ladder. The assault ladder is required for passing dismounted soldiers through AT ditches, over AT walls, and into fortified buildings. It can also be used to lay over wire obstacles. Every engineer APC should carry an assault ladder strapped to its side.

In some cases, vehicles cannot be used to pull wire entanglements off assault paths for fear of detonating AP mines in the process. To make an assault path, soldiers may prepare material to be placed over the wire. The assaulting troops must clear the wire of AP mines before laying this material on the wire. *Figure C-12, page C-14*, shows a footpath made by using boards attached to a roll of chicken wire. Many variations are possible, based on available materials.

Covert Breaching

Many of the techniques already described are useful for covert breaching. Even explosive techniques are useful if the charges are installed but not detonated until the attack begins. However, the typical covert breach is designed to allow silent passage of a dismounted assault force and must produce a lane without alerting the enemy.

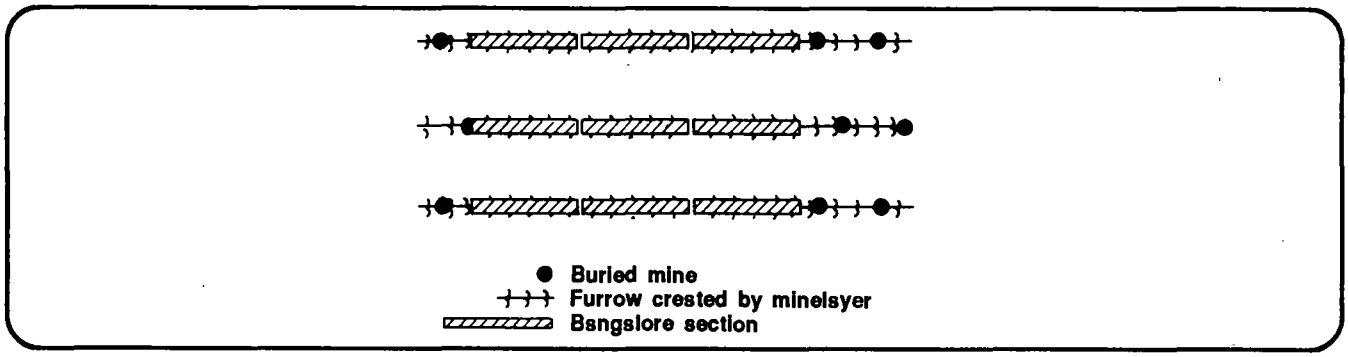


Figure C-10. Placing bangalore sections to breach a mechanically emplaced minefield.

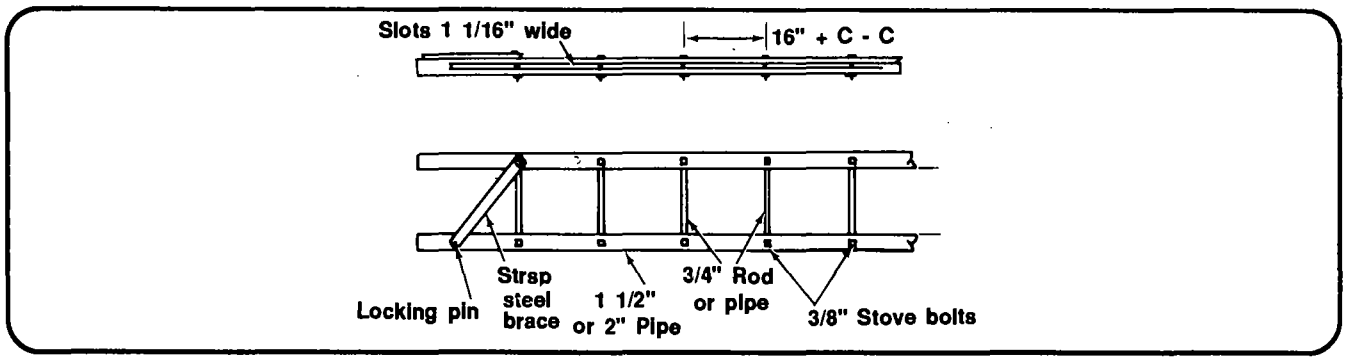


Figure C-11. Folding assault ladder.

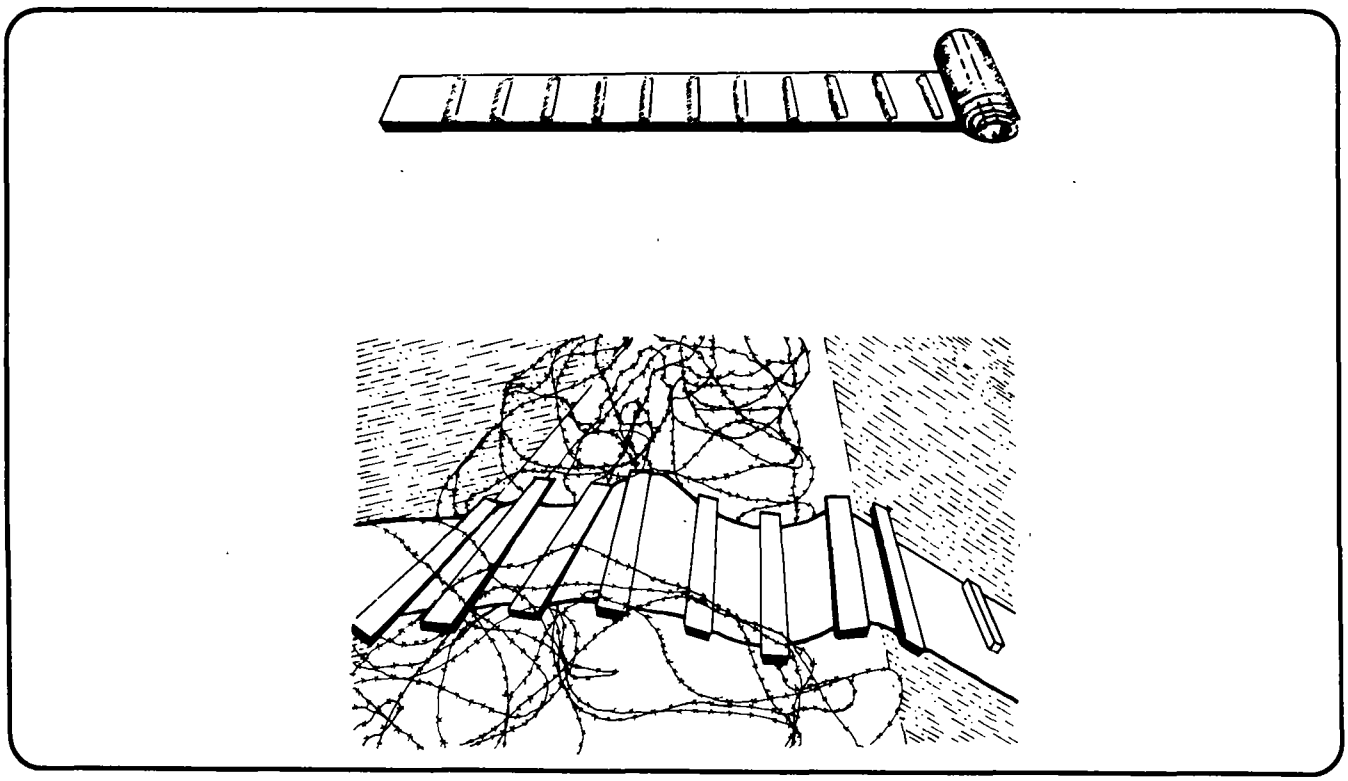


Figure C-12. Barbed wire ramp.

A sapper squad leader designates a team to conduct a covert breach of a minefield. The three-member team consists of two probers and a lane marker and cutter (see *Figure C-13*). The team removes all equipment except for flak vests and weapons and rolls up their sleeves. Only nonmetallic probes are used. Mine detectors, grapnel hooks, and explosive charges are prepared for contingency use. The team uses stealth and available cover and concealment during movement to the breaching site. The two probers position themselves next to each other. The lead prober clears a path 1 meter wide; the second prober follows one body length behind, overlapping the first path by 0.5 meters. They trace trip wires to their origin, cutting slack wires and marking taut ones. Once a mine is discovered, it is marked. All mines and taut trip wires are bypassed by at least 2 meters. The breach lane turns as mines and taut wires are encountered and marked. Initially, the breach centerline is marked. The lane is improved by marking both sides, if time permits. The probers mark with chemical lights, tape, or field-expedient markers. If a chemical light is used, it must be a different color than the ones used for marking mines. The lights must also be shielded from enemy observation. Extensive trip wires and mines may justify the need to use explosive manual breaching to open the lane and serve as the signal for suppression, obscuration, and assault.

A sapper squad prepares a three-member breach team for the covert breach of wire. The team uses stealth and available cover and concealment during movement to the breaching site. The team consists of a cutter and two holders and probers. The team probes up to and conducts an inspection of the wire obstacle, looking and feeling for pressure prongs and trip wires. After an area of the wire has been cleared of booby traps, the two holders hold the wire. To reduce noise, one soldier wraps cloth around the wire where it will be cut. The soldier with the wire cutters then cuts part way through the wire held between the other two soldiers' hands. The wire is then bent back and forth until it breaks. This continues until the wire portion of the obstacle is cut through. Then the team stakes down or ties the wire to prevent it from springing back and closing the breach.

Lane Marking

Initially, all lanes are marked with centerline, entrance, and exit markers. These are installed during and after obstacle reduction to ease passage of the assault force. As required, markings are improved for follow-on forces and are eventually replaced with permanent fencing.

The CLAMS allows rapid, remote marking of the breached lane that can be seen at night. It can be mounted on the rear of any M1 tank without major modifications. It is only adequate for the initial assault and must be replaced and improved as soon as possible with a two-sided marking using a HEMMS or according to the unit SOP.

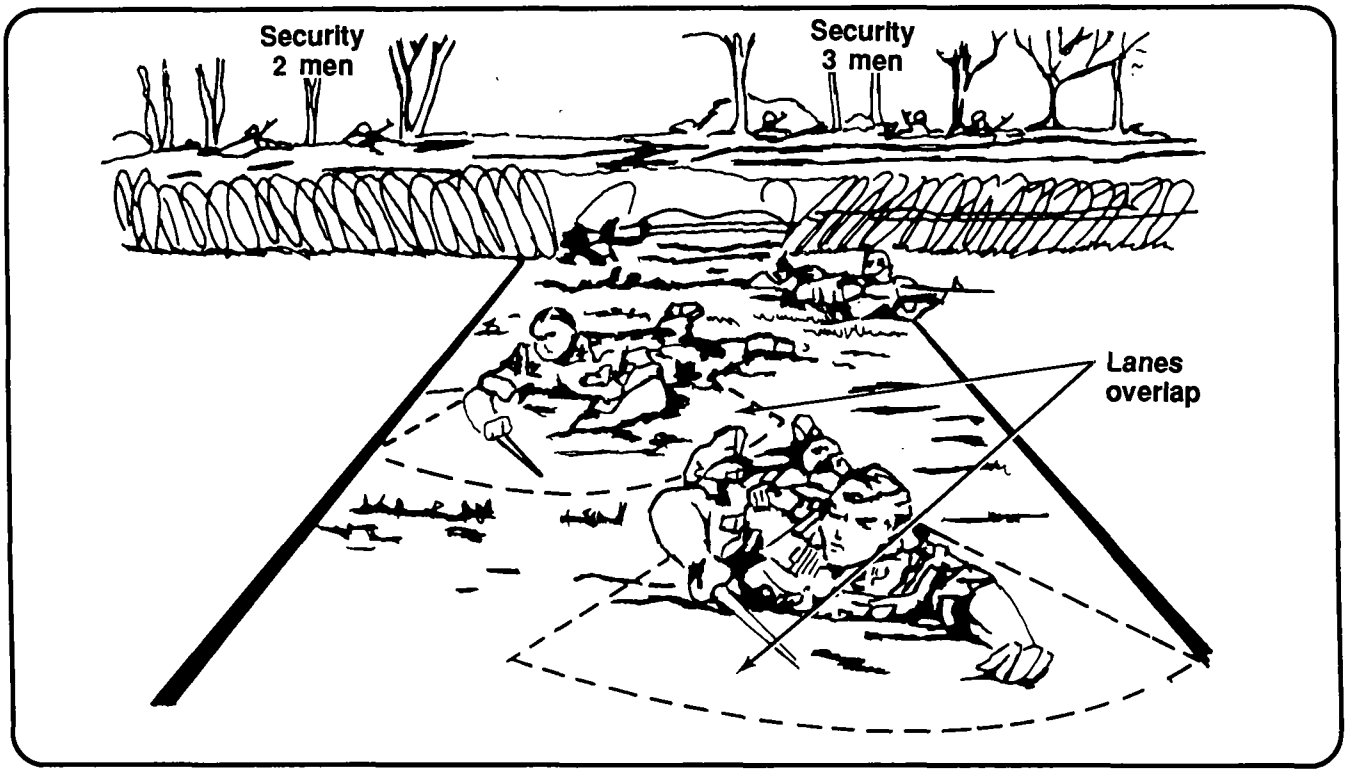


Figure C-13. Probers clearing a path.

A critical requirement for the initial marking of assault lanes is to provide marking that buttoned-up vehicle crews can see easily through smoke. Tanks and BIFVs have infrared sights that can see heat sources through smoke. Centerline marking can use infrared chemical lights, railroad flares, or simple smudge pots made from cans filled with earth and diesel fuel.

A simple system for centerline marking uses HEMMS poles cut to 18-inch length and wrapped with fluorescent flagging. Chemical lights can be inserted into the ends of the poles if they are needed. Both ends of the flagging are left free to blow in the wind and aid visibility. A soldier can carry a spare M60 machine-gun-barrel bag full of stakes and install them as he unrolls detonation cords or places charges (see *Figure C-14*). Other techniques are to unroll flagging or engineer tape along the centerline. Tent pegs are inserted through the tape at intervals to pin it to the ground. If necessary, chemical lights are taped into the V at the top of the tent peg.

Bicycle flags on 6-foot nylon poles are useful for marking the sides of a lane. They can also be fastened to a cross brace on the center of an AVLB so that tank drivers can center their vehicles and cross faster.

Highway marker cones are useful for marking a V-shaped entrance to a lane and can be used to mark the centerline if it is shorter than 18 inches. If large cones are available, they should mark each side of the lane in pairs.

U-shaped pickets can be used to mark the sides of the lane instead of centerline markings. The pickets should be installed close together (no more than 5 meters apart) and have flagging looped between them to provide a visual "wall" at the edge of the lane. Chemical lights are taped to the pickets for night operations.

Wire is installed to mark each side of the lane after the assault force has passed through the obstacle. It can either be a standard cattle fence or simply one set of concertina staked to the ground. Standard minefield-marking signs are hung on the fence.

Plywood panels are used to make high-visibility entrances to lanes. They are deployed in a huge V shape (like a fish trap) so that a follow-on unit can quickly orient on the lane and pass through with minimal delay. Generally, the panels are half or full sheets of plywood with large arrows painted on one side and the reverse side painted with camouflage paint. The first set is installed 500 meters ahead of the obstacle and spread about 500 meters apart with the arrows pointed to the center. The second set is installed about 250 meters ahead of the obstacle and spread about 250 meters apart with the arrows also pointed to the center. The final set is at the entrance of the lane and is installed at both sides of the lane. Plywood panels are prepared before the attack and can be carried in the bowl of the M9 ACE. They are normally installed after the assault force has attacked the defender but before the obstacle is turned over to follow-on forces.

Example of Multiple Reduction Techniques

A breach force may be task organized with multiple reduction assets to be employed simultaneously. For instance, the breach force may consist of a tank platoon with three plows and a roller as well as an engineer and infantry platoon, each towing a MICLIC.

The MICLIC charges are reserved for the most dangerous minefield. If the first minefield encountered is a surface minefield, the plow tanks engage the plows and move through the minefield, marking the centerline of each lane with the CLAMS. In this case, the breach force will attempt to create two plowed lanes, keeping the remaining plow tank in reserve for close-in overwatch and suppression. The infantry and engineers assist with suppression from their vehicles and provide close-in security with dismounted squads.

If the obstacle is a buried minefield, the engineer squad carrier deploys into the obstacle and fires the MICLIC. The dismounted squad marks the entrance to the lane and is prepared to employ dismounted breaching techniques if the mechanical breach fails. The plow tank towing the second MICLIC launcher immediately enters the lane breached by the first MICLIC, moves two vehicle lengths into the lane, and fires its MICLIC. It passes through the minefield, marking the centerline with its CLAMS, and moves out of the way of follow-on forces into an ABF position on the far side. If the complex obstacle system contains more minefields, the plow tank waits until dismounted infantry reaches it and passes through the later minefields; then it engages its plow and continues to breach. The dismounted infantry pass through the lane immediately after the firing of the second MICLIC to secure the far side of the obstacle.

The variety of reduction techniques is virtually unlimited and depends on the initiative of the dismounted soldier. Most techniques involve common hand-tools such as shovels to knock down the sides of AT ditches, wire cutters to cut barbed wire, and axes and chain saws to cut logs and trees. These techniques will not be discussed because there are so many of them. However, the breacher should be aware of and capitalize on all the simple ways he has available to get the force through the obstacle.

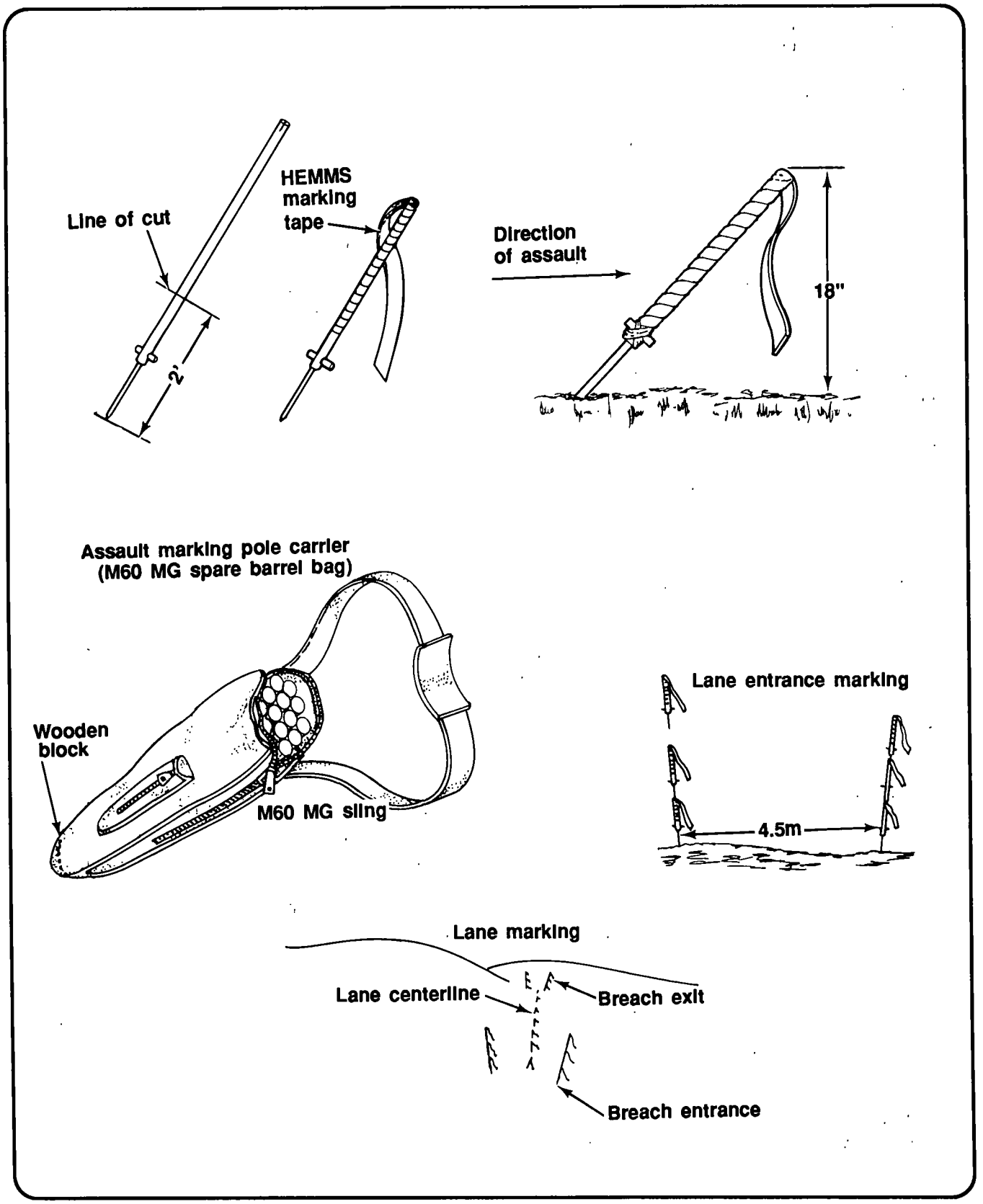


Figure C-14. Modified HEMMS lane-marking system.

Appendix D
Breaching Rehearsals

This appendix provides commanders with tools necessary for planning and executing effective breaching rehearsals. At first glance, breaching rehearsals appear complex and difficult to accomplish. An essential element to successful breaching operations is the rehearsal. History indicates that successful rehearsals lead to battlefield success. Ideally, commanders will take these tools and incorporate them into their tactical SOPs.

REHEARSAL PLANNING FUNDAMENTALS

The rehearsal planning fundamentals have three subcomponents. They are—

- Participant levels.
- Techniques.
- Principles.

These fundamentals aid the commander in deciding who, what, where, when, and how to rehearse. The "who" is the level of breaching participants, and the "how" is the rehearsal techniques.

Participant Levels

The level of participants details exactly who in the unit is required to attend the rehearsal. Standard rehearsal levels in tactical SOPs facilitate passing rehearsal warning orders and managing time. Each unit tailors and develops its own definition of participant levels. The following guideline is recommended:

- Level 1 - Battle staff (XO; Adjutant (US Army) (S1), S4; S2; S3; S3 Air; Engineer; FSO; air liaison officer (ALO); ADO; and NBC Officer).
- Level 2 - Commander, battle staff, scout platoon leader, and subordinate commanders (with FIST).
- Level 3 - Commander, battle staff, communications-electronics signal officer (CESO), scout platoon leader, mortar platoon leader, support platoon leader, subordinate commanders, subordinate commanders' key leaders, AT platoon leader, and medical platoon leader.
- Level 4 - Entire unit.

Rehearsal Techniques

Rehearsal techniques fall into four different categories that follow the "crawl/walk/run" training concept. These categories are—

- Back brief.
- Rock drill.
- Walk through.
- Full-scale.

Each type of rehearsal reflects an increase in mission realism and a corresponding increase in rehearsal payoff. Each type also increases the realism of the enemy, terrain, subunit actions, and time/distance relationship.

As the benefits of realistic breaching rehearsals increase, so do the costs. There is a direct relationship between the amount of breaching rehearsal realism and the amount of time, materials, and manpower required to conduct the rehearsal. Commanders must balance the trade-offs.

Back Brief. The back-brief rehearsal is an event that occurs after an OPORD brief. Subordinates repeat to the commander what he expects them to do and why they are to do it. They identify all specified and implied tasks, determine their mission-essential tasks, and give their restated mission. During the back brief, they address the—

- Commander's intent.
- Concept of the operation.
- Subordinate role in the scheme of maneuver.
- Timing to complete tasks.

This rehearsal is not limited to subordinate commanders but can also include staff officers and key subordinate leaders (such as scout platoon leaders). During a typical back brief, each leader uses a map or a sand table and explains his mission. Another alternative, which is more appropriate in the defense, is to conduct the back brief overwatching the same terrain in which the operation will occur. This is conducted much the same as a TEWT.

The primary advantages of a back-brief rehearsal are—

- Saving time.
- Clarifying the commander's intent.

The back brief is the quickest of all the rehearsal techniques. During back briefs, commanders can identify problems and disconnects in execution but to a lesser degree than in the other rehearsal techniques. The back brief is a leader's tool and is typically the first rehearsal for the unit.

Rock Drill. A rock-drill rehearsal is the acting out of friendly and enemy actions based on the scheme of maneuver and the situation and event templates. Participants rehearse their actions by moving themselves or something that represents their unit, such as rocks or sticks. While acting out the plan,

participants talk through their missions, critical tasks, actions, decisions, and their coordination with adjacent and higher units. Staff officers interject critical unit-level actions and tasks as the scheme of maneuver is acted out. Since all participants are simultaneously acting out their part of the scheme of maneuver, commanders can identify problems and disconnects in synchronization more clearly in a rock drill. Moreover, because enemy actions and reactions are portrayed during the rock drill, it provides participants with a clearer visualization of the situation and event templates. This technique is the most common one used at the TF level.

Walk Through. A walk-through rehearsal is the acting out of the scheme of maneuver using mounted or dismounted movement based on the assets employed during the attack. In the same vein, the participants communicate, with the same equipment they will use during the attack, which is primarily a frequency modulation (FM) radio. Participants rehearse by—

- Maneuvering their vehicles (mounted movement) or themselves (dismounted movement).
- Reporting critical actions.
- Making the decisions required to execute the breach.

Since the participants are in a more realistic environment, they rehearse the finer aspects of synchronization, command and control (C^2), and subunit actions. Aggressive portrayals of the enemy actions and reactions are critical in walk-through rehearsals. The S2 plays a crucial role by interjecting elements of the event template and by providing anticipated battle damage assessment (BDA) and analysis. This threat portrayal is the backbone of increasing the rehearsal realism. This rehearsal technique is more difficult to orchestrate than the back brief or rock drill; however, it is the optimal balance between resource constraints and realism. Successfully mastering a walk-through rehearsal should be the minimum goal for all units.

Full-Scale. During a full-scale rehearsal, participants use real-time mounted and dismounted movement over the actual or similar terrain. Understanding the scope of the full-scale rehearsal is important. Typically, it is conducted at Level 4; however, a mix of participant levels is possible. The commander could deem one subunit's task so complex, critical, and/or essential for force synchronization that he wants them to be at Level 4. The other subunits could be at a lower level of participation. At least one subunit must participate at Level 4 for a full-scale rehearsal. For example, during a brigade deliberate breach, the commander determines that the actions of the brigade's breach force are critical to mission success and that the brigade should synchronize its actions. The commander could have the breach force conduct a full-scale, Level 4 rehearsal while maintaining a Level 3, walk-through rehearsal for the brigade's support and assault forces. At every level, units replicate as closely as possible the actions they should take under realistic conditions. This type of rehearsal is obviously the most resource intensive, but it provides the most realistic training environment for the unit. It is most often used to rehearse the operation plan (OPLAN) or OPORD when time is not an immediate constraint.

Extensive planning is required to execute full-scale rehearsals correctly and not waste soldiers' time. The same amount of prior planning is required for a full-scale rehearsal as for an FTX.

Rehearsal Principles

Regardless of the event or task to be rehearsed or the type of rehearsal used, certain principles are universal for conducting effective rehearsals. They are—

- Support the scheme of maneuver and the commander's intent.
- Provide clear tasks/conditions/standards (T/C/S).
- Conduct multiechelon, combined arms rehearsals.
- Determine key participants.
- Enforce standards/train to standard.
- Provide feedback.
- Complement the preparation phase.
- Instill confidence in the plan and in the leaders.

During the command estimate process, the rehearsal principles are used. These principles produce the rehearsal technique, the level of participants, and the initiation of mission-specific drills. Proper application of the rehearsal principles enables the unit to progress through a crawl/walk/run process that ends with mission success (see *Figure D-1*).

Applying the eight rehearsal principles toward breaching operations provides the commander with the basic framework for planning and executing successful breaching rehearsals. This also enables the commander to optimize the time available for breaching rehearsals and preparation.

Support the Scheme of Maneuver and the Commander's Intent. The first step in planning a breaching rehearsal is analyzing the scheme of maneuver and the commander's intent. The commander uses the unit's concept of the operation and the execution matrix (see *Figure D-2, page D-4*) to analyze the tasks required during the breaching phase of the operation. The TF commander and S3 circle the critical breaching tasks on the execution matrix. *Figure D-2, page D-4,* is an example of an execution matrix for a deliberate breach operation. Typically, a phase is devoted to punching through the enemy's obstacle system for a TF deliberate breach. These tasks focus on the execution and responsibilities of SOSR and the support, breach, and assault forces. These identified tasks dictate the major collective tasks that are required by the company teams. *Figure D-2, page D-4,*

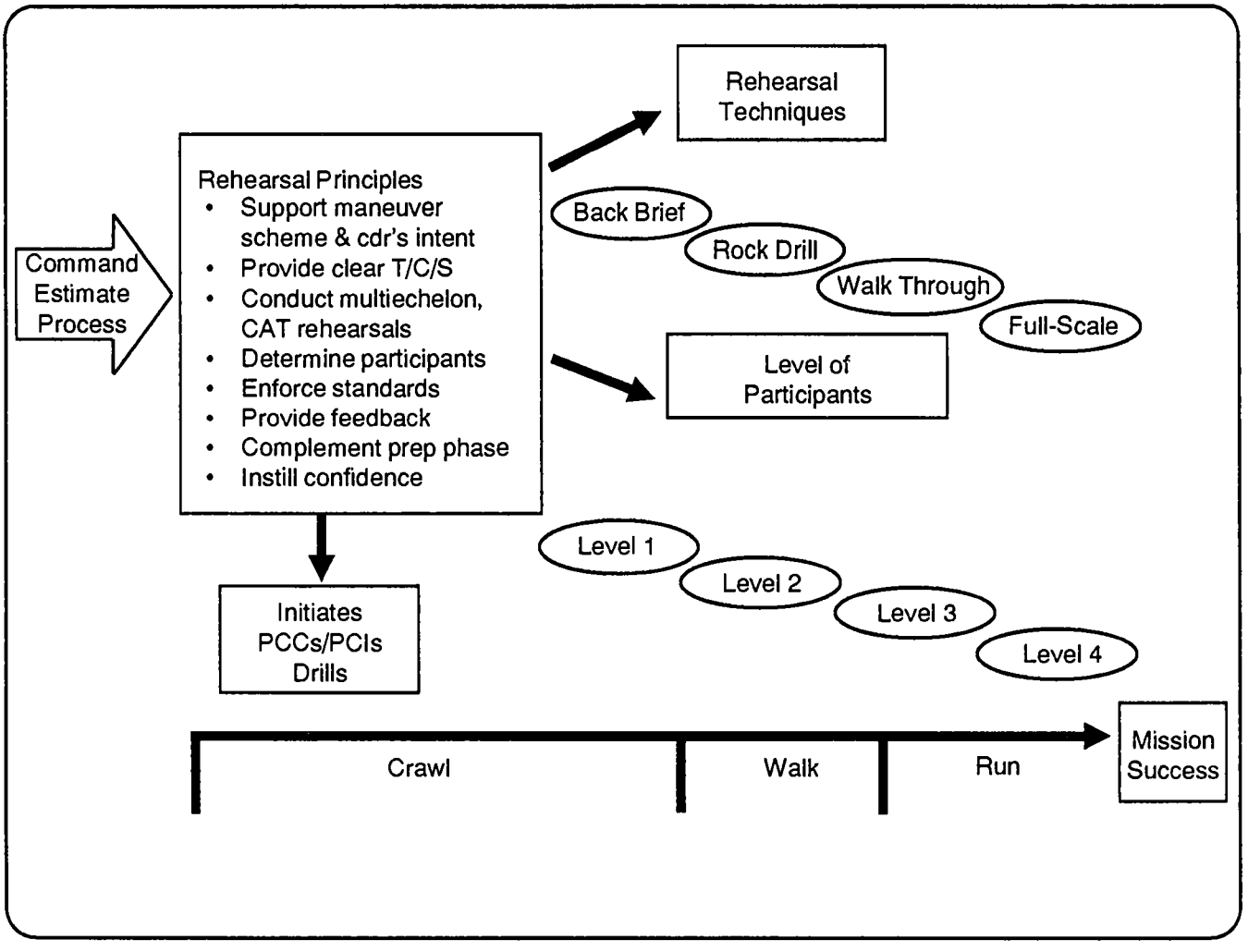


Figure D-1. Rehearsal planning.

depicts the tasks the TF commander and the S3 identified. Identifying the tasks in the context of the execution matrix accomplishes three things for the TF.

- It establishes the maneuver conditions that are set before the execution of the breaching rehearsal tasks. For example, the maneuver conditions are: Team A and Company B (-) are on Axis Blue, vicinity PL Arrow; Team C and Team Engineer are on Axis Red, vicinity PL Arrow; Team D (TF Reserve) is at CP 11.
- It identifies a specific area of the execution matrix at which the breaching tasks will be accomplished. This further refines adjacent unit tasks that are required to support the breaching tasks. Referring to *Figure D-2, page D-4*, Team A and Company B (-) occupy ABF position B3, while the breach force (Team Engineer) and assault force (Team C) continue down Axis Red.
- It identifies the tasks that must be accomplished before the TF can transition to the next maneuver phase. In other words, the maneuver standards are established. In *Figure D-2, page D-4*, before Team A can seize OBJ 1B, Team C must seize OBJ 1A and be ready to pass Team A.

When time runs short, the commander has three choices to reduce the rehearsal time required or to refocus the breaching rehearsal tasks.

- The TF commander and S3 prioritize tasks to be rehearsed, beginning with the most critical (see *Figure D-2, page D4*). The TF commander and S3 use the TF's breaching proficiency, the complexity of the tasks, and the amount of time available to dictate the tasks to be rehearsed.
- The TF commander and S3 eliminate tasks to be rehearsed by using war-gaming techniques (box, belt, or avenue-in-depth) (see *Figure D-3, page D-5*). Consider the practical application of these techniques. The box technique could focus on Team Engineer's tasks and passing the assault force (Team C). The belt technique could focus on the tasks from PL Arrow and

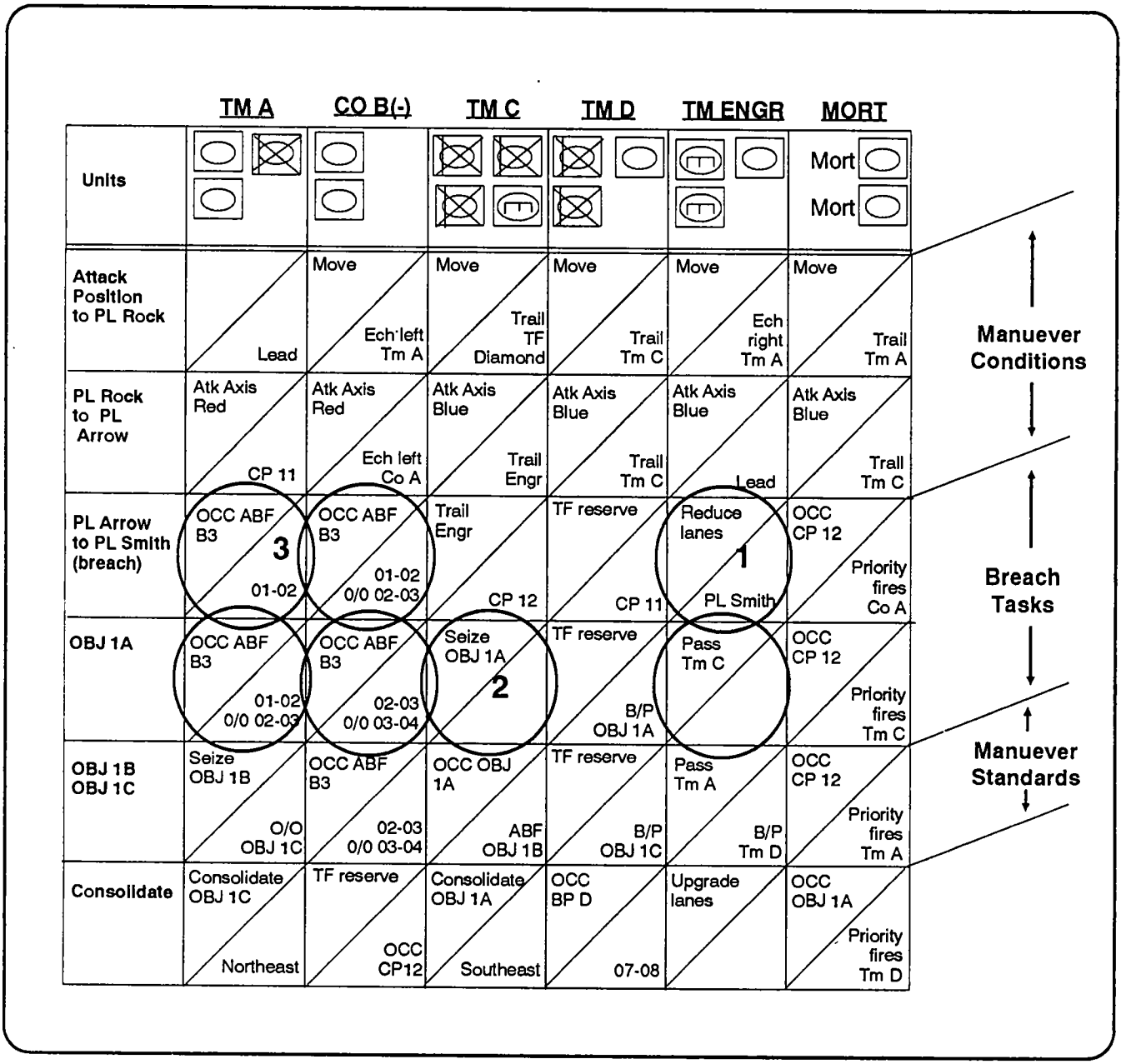


Figure D-2. Execution matrix for a deliberate breach operation.

PL Smith, the occupation of ABF position B3, and breaching the lanes through the tactical obstacles. The avenue-in-depth could focus on Team C's tasks, passing through Team Engineer, assault breaching and seizing OBJ 1A, and finally passing Team A. The box technique is the quickest, but it severely limits the scope. The belt technique rehearses all unit breaching actions concurrently. The avenue-in-depth rehearses breaching actions along one axis at a time and is the most complete type of rehearsal.

- The TF commander and S3 can choose a short rehearsal technique, either back brief or rock drill.

At all levels, the scheme of maneuver and the commander's intent must be understood in relation to selected tasks. It is the commander's intent that prevails and provides the framework for subordinate commanders to execute the initiative. Relating this to breaching rehearsals is essential. For example, the support force's mission is to occupy ABF B3 and to orient on TRPs 01 to 03. The commander's intent and the scheme of maneuver is to mass suppressive fires for the breach and assault forces to achieve initial penetration of the objective. If the enemy template was not confirmed, then the unit might have to adjust the point of penetration during its movement toward

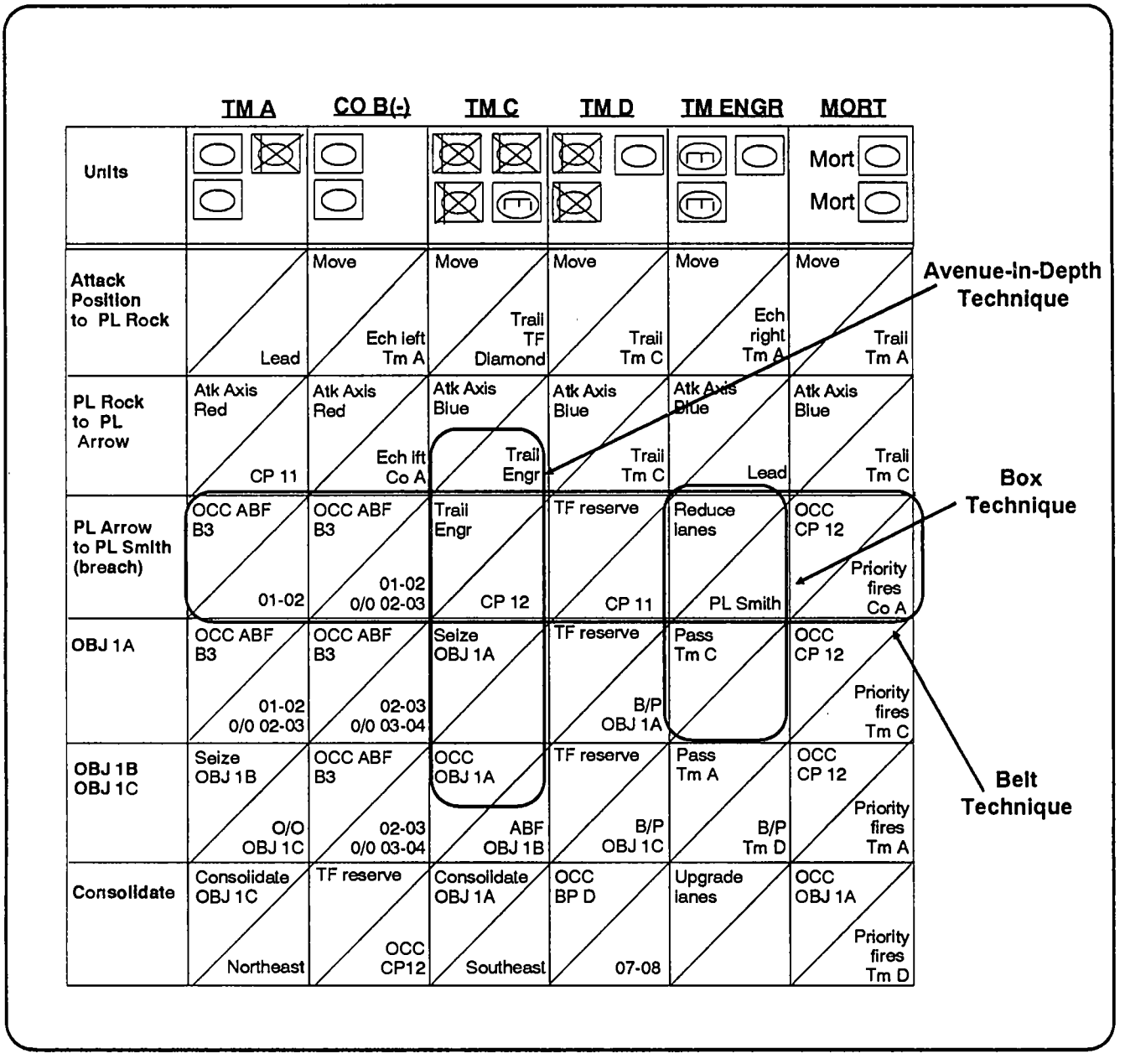


Figure D-3. War-gaming techniques.

the objective. The support force's understanding of the commander's intent allows him to exercise initiative and adjust his ABF position to provide necessary suppression and obscuration.

The commander's challenge is testing the understanding of his intent during breaching rehearsals. During the "run" phase of his breaching rehearsal, the commander interjects changes in the conditions, missions, and/or unit orientation. By observing the reaction of the breaching rehearsal participants, the commander can test whether his intent was completely understood.

Provide Clear Tasks/Conditions/Standards. This principle focuses on each subunit's rehearsals and its role in the specific tasks it is required to execute as part of the unit's overall breaching operation. Like any training event, breaching rehearsals require clear T/C/S. The commander uses the situation and event templates and the breaching fundamentals and organization to determine the actual T/C/S composition. The maneuver commander and S3 use their knowledge of the MTPs to clarify the standards. *Table 7-5, page 7-6*, provides a foundation for identifying subunit collective tasks (from MTPs) in executing breaching operations.

Identifying T/C/S is not limited to maneuver and engineer units. For example, the FSO's subtasks focus on providing suppression and obscuration. The ADO's breaching subtasks focus on protecting the unit from enemy air. In the same vein, combat service support (CSS) subtasks focus on sustaining the unit by planning—

- Casualty collection points.
- Jump aid stations.
- Dirty and clean main supply routes (MSRs).
- Hasty decontamination sites.
- Combat trains support and movement.

The intelligence collection plan verifies or denies the enemy situation template and actually justifies the breaching rehearsal tasks required to accomplish the mission. As a minimum, the breaching rehearsal T/C/S defines success for the support, breach, and assault forces.

The situation template provides the commander with additional conditions for the breaching rehearsal tasks. These conditions must be reflected in the breaching rehearsal site. The S3 tasks subordinate units to construct the rehearsal site. It is picked because of its resemblance to the actual terrain the mission will be conducted on. The rehearsal site replicates the enemy's tactical and/or protective obstacle effort.

- **S2**
  - — Event template
  - — Situation template
  - — Enemy's direct- and indirect-weapons effects
- **Engineer**
  - — Enemy's countermobility effects (includes SM)
  - — Enemy's survivability effects
- **FSO**
  - — Counterbattery
  - — Indirect-fires effects
  - — Obscuration
- **ADO**
  - — Enemy air
  - — SAFAD- and ADA-weapons effects
- **Chemical Officer**
  - — NBC effects
  - — Smoke-platoon effects

Figure D-4. Battle staff input for conditions.

Other staff officers ensure that additional conditions are portrayed while the breaching rehearsal is being conducted (see *Figure D-4*). The conditions could require that added tasks be performed, especially individual and crew drills. FM 25-101 elaborates on the composition of the condition statement.

The commander establishes the breaching rehearsal standards. Using the full range of available MTPs, he modifies the standards to match the mission requirements. For example, according to the event template, there is a possibility of an enemy counterattack within 30 minutes after the initial penetration of the objective. This might dictate stricter time standards in consolidating and establishing a hasty defense or passing combat power through the breaching lanes. The standards indicate actions required during execution. The execution and synchronization of SOSR become the key elements in establishing the standard for the major breaching rehearsal.

The commander issues elements of the T/C/S in the rehearsal warning order (see *Figure D-5*). Like a warning order, the rehearsal warning order helps focus subunit preparation. Time is always critical. Once a scheme of maneuver is developed and critical subunit tasks are identified, the rehearsal warning order should be issued. At the rehearsal, the T/C/S are briefed by the commander, the S3, and the S2.

Conduct Multiechelon, Combined Arms Rehearsals. The breaching rehearsal warning order keys subordinate units on the collective tasks that must be performed. The subordinate leaders determine the supporting collective tasks and drills necessary to accomplish the breaching rehearsal tasks. This permeates the unit's mission preparation from precombat checks and inspections through soldier's and leader's tasks; crew, squad, and platoon drills; and company collective tasks. It is imperative that subordinate units conduct their rehearsals before the next higher echelon's rehearsal. This ensures that time is not wasted at each echelon's rehearsal due to inadequate preparation. The commander must allocate time for subordinates' rehearsals since they are critical to the success of his own. *Figure D-6, pages D-8 and D-9*, shows a comparison of deliberate and in-stride breach preparation time lines.

Breaching operations are truly a combined arms effort and cannot be solely maneuver oriented. A successful breaching operation demands the synchronization of all the battlefield operating systems (BOSs). A commander ensures the breaching synchronization by rehearsing with a combined arms team.

Determine Key Participants. Breaching rehearsals should be as close to full-scale as possible; however, due to time

CLASSIFICATION

TO:

FROM:

SITUATION:

ATTACHMENTS/DETACHMENTS:

REHEARSAL TECHNIQUE: LEVEL:

TASKS:

TIME/PLACE OF REHEARSAL:

ADMINISTRATIVE/LOGISTIC INFORMATION:

Figure D-5. Rehearsal warning order format.

constraints and the scope of the operation, full-scale rehearsals are not always practical. With sufficient time available, a more deliberate training progression (crawl/walk/run) toward breaching rehearsals can be planned. Initially, only key leaders are involved in back briefs, progressing through rock drills and walk throughs and finally ending with a full-scale rehearsal.

The commander helps determine the level of participation by analyzing the unit's—

- Breaching proficiency (at all echelons).
- Time available.
- Familiarity with the unit's SOPs.
- Overall training readiness.

A high level of breaching proficiency lowers the required level of participation. The type of breach also influences the level of participation. For deliberate, assault, and covert breaches, it is desirable to progress to a full-scale, Level 4 rehearsal. For an in-stride breach, a walk-through, Level 3 rehearsal is desirable. Subunits that were allocated the assets to conduct the unit's in-stride breach would conduct a

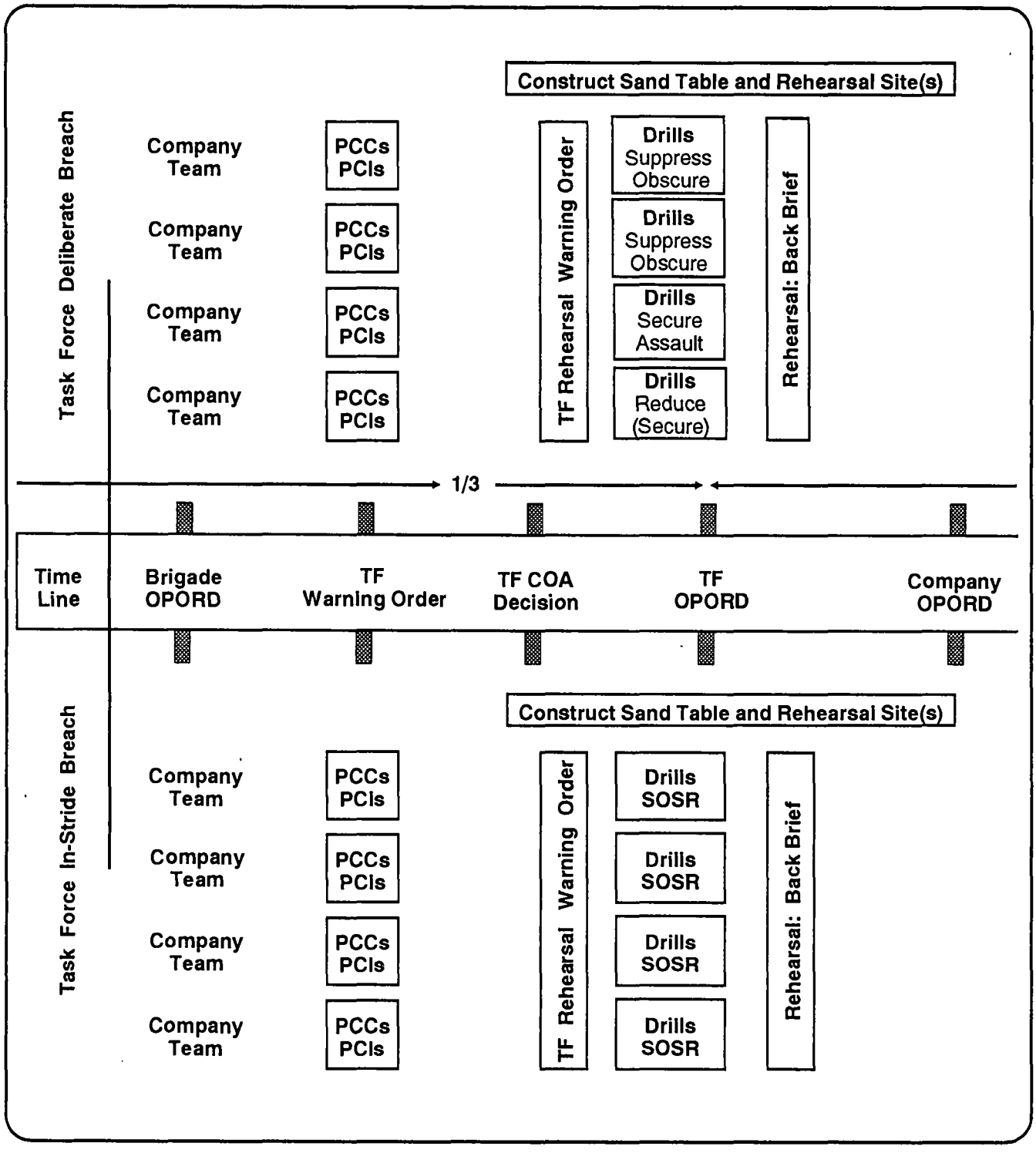


Figure D-6. Deliberate versus instride rehearsal time line.

full-scale, Level 4 breaching rehearsal before the unit's walk-through, Level 3 rehearsal.

The commander uses the one-third to two-thirds rule of thumb to determine the time available for his subordinates (see *Figure D-6*). Breaching rehearsals should be scheduled after subordinate units have had time to prepare. In the crawl/walk/run approach, units conduct less intense, small-scale breaching rehearsals (Level 1 to Level 3), gearing up the higher commander's rehearsal or to a full-scale rehearsal (Level 4). In order to obtain the maximum

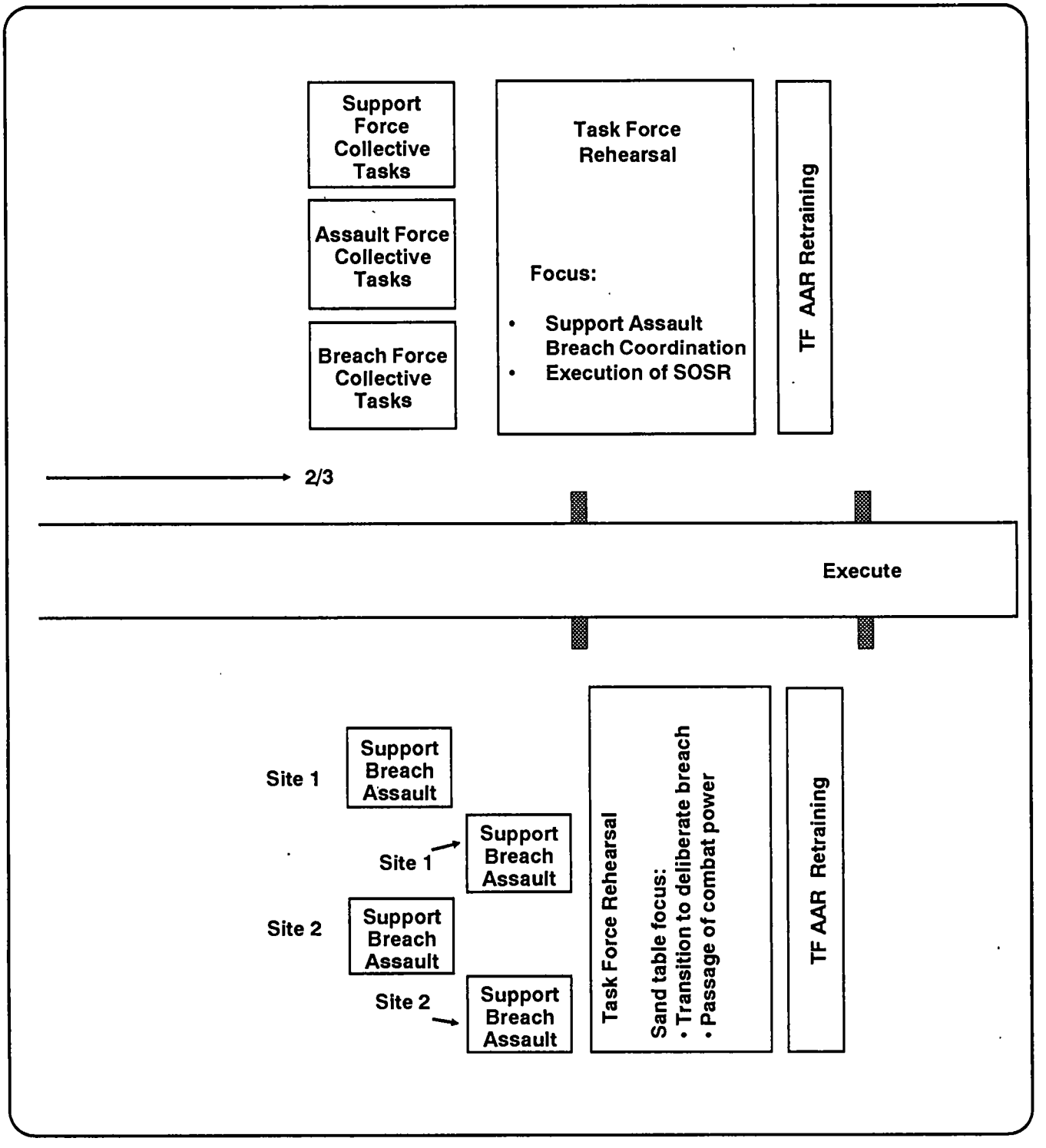


Figure D-6. Deliberate versus instride rehearsal time line (continued).

benefit, echelonment of and tracking rehearsals is a critical leader task.

The commander recognizes the training strengths and weaknesses of his unit. A highly trained unit could focus on its complex tasks with walk throughs and reduce the level of participation. For example, if a unit is highly trained on conducting a deliberate breach, a Level 2 or Level 3 walk-through rehearsal is all that might be required.

Enforce Standards and Train to Standard. The commander defines the breaching rehearsal success for each subordinate unit by enforcing the standards. This aids the subordinate units in determining exactly what is expected from them during execution. Retraining for breach execution deficiencies is built into the rehearsal. This is critical. While the goal is to do it until you do it right, time may require training to the 80-percent solution. The overall goal of any rehearsal is to ensure that the unit can accomplish the tasks required for mission success. This can only be done by enforcing the standards. Characteristically, a unit performs the same way it rehearsed. As mentioned earlier, clear standards are set; the expectations of performance should equal or surpass the established standards.

Provide Feedback. The after-action review (AAR) is the process used to provide feedback to all participants. *FM 25-101* defines AARs as a structured review process that allows training participants to discover for themselves what happened, why it happened, and how it can be done better. The commander uses his rehearsal T/C/S to focus his subordinates' comments and ensure that the AAR does not stray from the designated breaching rehearsal tasks. The commander sets the tone by reviewing the rehearsal standards and gives his assessment of unit performance. Better ways of accomplishing the missions and tasks come from the participants. During the rehearsal, problems with the plan could arise. It is essential that the identified problem(s) are solved and that plans are modified to overcome the potential problem. The changes must be incorporated into all the plans and highlighted to leaders who did not attend the breaching rehearsal. The refined plan must be rehearsed. Time may require that a different type of rehearsal or a different level of participants be used. For example, after an AAR of a full-scale rehearsal, the commander may take the rehearsal participants to the sand table for a back brief.

The unit's leaders (commander, XO, S3, and Command Sergeant Major (CSM)) will collectively monitor subordinate units' rehearsals. This is applicable to any breaching operation. In the examples at the end of this appendix, the focus is on a battalion/TF conducting two different types of breaching operations (deliberate and in-stride). For a deliberate breach, the unit's leaders observe the designated support, breach, and assault forces' rehearsals and the execution of their specified SOSR responsibilities. For a TF in-stride breach, the unit's leaders focus on the overall breaching performance of company teams. The company teams organize their own support, breach, and assault forces and synchronize the execution of SOSR. For an assault breach, the unit's leaders must look at platoon performance because of the nature of this type of breach (see *page 5-1*). For a covert breach, the unit's leaders focus on the same elements as in a deliberate breach; however, they must understand that the SOSR is executed differently (see *page 6-1*).

Subordinate leaders are required to provide their rehearsal schedule to the unit's tactical operations center. As mentioned earlier, this aids the commander in breach rehearsal training, synchronizing, and resourcing.

Complement the Preparation Phase. The breaching rehearsal is an innate part of a unit's preparation. As part of the command estimate process, the unit's S3 should tentatively incorporate breaching rehearsals as part of his time analysis and time line. It should never be a training distractor. Rehearsals can become distractors because of—

- Improper application of the breaching rehearsal principles.
- Inadequate time management.
- Lack of rehearsal training and unit SOPs.

Breaching rehearsal principles provide the commander with the tools to ensure proper unit preparation.

Instill Confidence in the Plan and in the Leaders. In addition to ensuring synchronization, a by-product of the breaching rehearsal is confidence. After the rehearsal AAR, the participants should have confidence in their own ability, their leader's ability, and the unit's plan. Confidence is contagious and will spread among the unit after a successful breaching rehearsal. Conversely, a poorly executed breaching rehearsal fosters doubt.

TASK FORCE REHEARSAL EXAMPLES

Understanding the total scope of breaching rehearsals is critical for the commander, his staff, and his subordinate leaders. The planning and preparation phase should be a rote process at all echelons. Leaders must initiate rehearsals and not wait for someone to spoon-feed the solution to them. An example of one TF deliberate breach rehearsal is given below. The discussion afterwards contrasts it to a TF in-stride breach rehearsal.

Task Force Deliberate Breach

The brigade commander and staff briefed their OPORD to their orders group. The TF received the mission to secure OBJ Steel as part of a brigade's attack to destroy a templated MRB in a hasty defense. An MRC is templated in OBJ Steel (see *page 4-11* for the TF scenario). *Figure 4-16, page 4-13,* depicts the brigade's maneuver graphics. The TF commander and his battle staff quickly analyze the scope of their mission and issue a warning order to the TF. The warning order orients the TF's subordinate leaders toward their upcoming mission, briefly detailing the—

- Situation.
- Attachments and detachments.

- Earliest time of move.
- Nature and time of operation.
- Time and place of OPORD issuance.
- Administrative and logistic information.

The subordinate TF leaders analyze the warning order and time available and then they issue a warning order. This warning order not only triggers movement, it provides the task and basis to initiate preparation for battle. Company commanders and separate platoon leaders direct that specific precombat checks (PCCs) and PCIs be performed. The PCCs and PCIs are annotated in their tactical SOP by type of operation.

Refer to *Figure D-7, pages D-12 and D-13*, for the company time line for a deliberate breach relative to the TF time line. PCCs and PCIs are depicted for the subordinate units after receiving the warning order.

While subordinate units are preparing for the breach, the TF battle staff conducts the command estimate process. The TF S3 reverse plans and establishes a time line for the TF. He outlines critical TF events and goals, such as movements to their attack positions, initiation of the R&S plan, and rehearsals. The TF commander selects one course of action from the staff's decision brief, gives his guidance, and reviews the S3's time line. From the essential task list and the draft subunit instructions, the TF commander and the S3 determine the critical TF rehearsal tasks (see *Figure D-8, page D-14*). The TF S3 recommends a back-brief, Level 2 rehearsal following the TF OPORD brief and a full-scale, Level 4 rehearsal after allocating time for subordinate units to conduct their own rehearsals. The TF commander considers the S3's recommendation and issues the following guidance:

Based on our training readiness, our last mission success, and the time available, I believe that more could be gained from a rock-drill rehearsal at Level 2, followed by a walk-through rehearsal at Level 3. Give maximum time for our support, breach, and assault forces to do a full-scale rehearsal; we'll focus on SOSR synchronization during the second rehearsal. While the CSM, the XO, and I check on company preparation, put together a rehearsal warning order and update the task organization, as we discussed. This would allow breaching rehearsals to begin immediately. I agree with your recommendation for a full-scale breaching rehearsal, but my gut feeling is that time will run too short to get the full benefits from it. Have a draft of the breaching rehearsal T/C/S ready when I return.

The S3 finishes the execution matrix, incorporating the information in the breaching rehearsal warning order (see *Figure D-8, page D-14*). The execution matrix and sketch are provided for in *Figures 4-18 and 4-19 on pages 4-14 and 4-16*).

After receiving the TF rehearsal warning order, subordinate units concentrate on their tasks. For example, the Team Eagle commander anticipates his requirements based on his role as the assault force commander. He and the engineer platoon leader study their assault force mission. They develop a rehearsal time line that complements the overall TF time line. They adopt the crawl/walk/run approach, moving from PCIs/PCCs through fire team, squad, and platoon drills and ending with collective tasks. The engineer squads integrate with the maneuver platoons as part of their drills. While the team is in its crawl rehearsal phase, the commander and the engineer platoon leader develop a tentative team plan and refine their walk/run rehearsal approaches. Critical tasks are identified, such as—

- Moving to the assault position in the combat column.
- Passing through the breach lanes.
- Conducting assault breach operations.
- Acting on the objective, keying on the destruction of two MRPs.

The Team Eagle commander decides that the mission-essential task is to be able to quickly pass his team through the enemy's protective obstacles. His number one priority is to conduct the assault breach rehearsal task. Team Eagle continues through its walk/run rehearsals as the commander, the FIST, and the engineer platoon leader attend the TF OPORD.

Initial Rehearsal. The TF briefs its OPORD. Following the OPORD, the TF commander directs the rock-drill, Level 2 rehearsal participants to the sand table. The TF commander states the tasks and standards, focusing on knowing the concept of the operation and the commander's intent for the rock-drill, Level 2 rehearsal. The S2 and S3 orient the rehearsal participants to the sand table and the essential elements of the situation. Each breaching participant tells the TF commander his role and major tasks in the TF's scheme of maneuver. Satisfied that all the participants know the plan, the commander conducts a quick AAR. As the participants leave, they tell the S3 their breaching rehearsal schedule.

Subordinate Rehearsals. At the company assembly area, the Team Eagle commander and the engineer platoon leader discuss the collective tasks that are required (see *Table 7-5*). The Team Eagle commander completes briefing his OPORD and receives a back brief. Team Eagle then conducts the necessary breach collective tasks tailored to the company's scheme of maneuver. During the "run" part of the assault force's rehearsal (full-scale, Level 4), the TF commander checks Team Eagle's progress and assesses their readiness.

Final Rehearsal. Time passes quickly and the Team Eagle commander, with his platoon leaders and FIST, attends the TF rehearsal (walk-through, Level 3). Team Castle and Team Talon replicated the enemy's obstacle effort with wire,

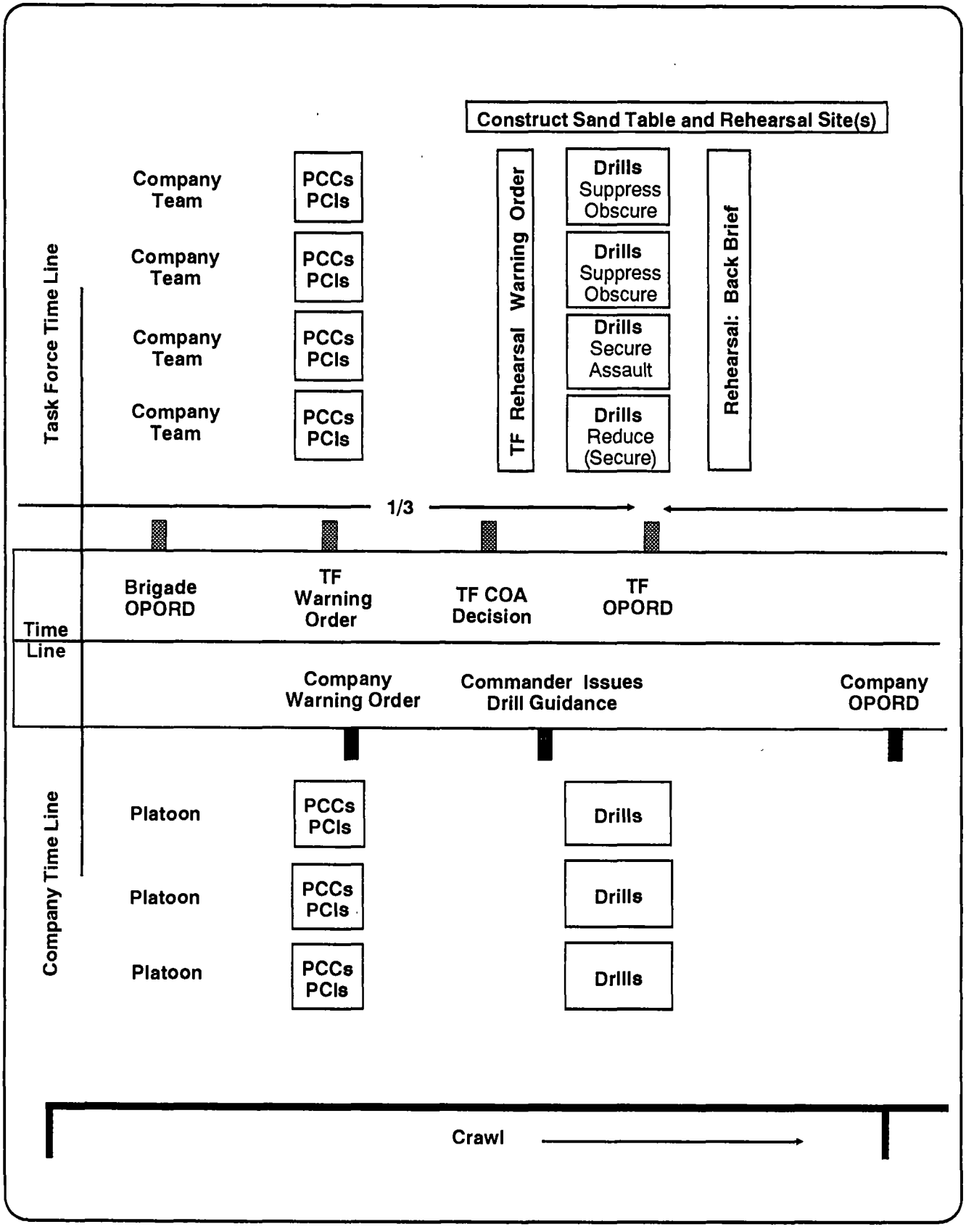


Figure D-7. TF versus company rehearsal time line.

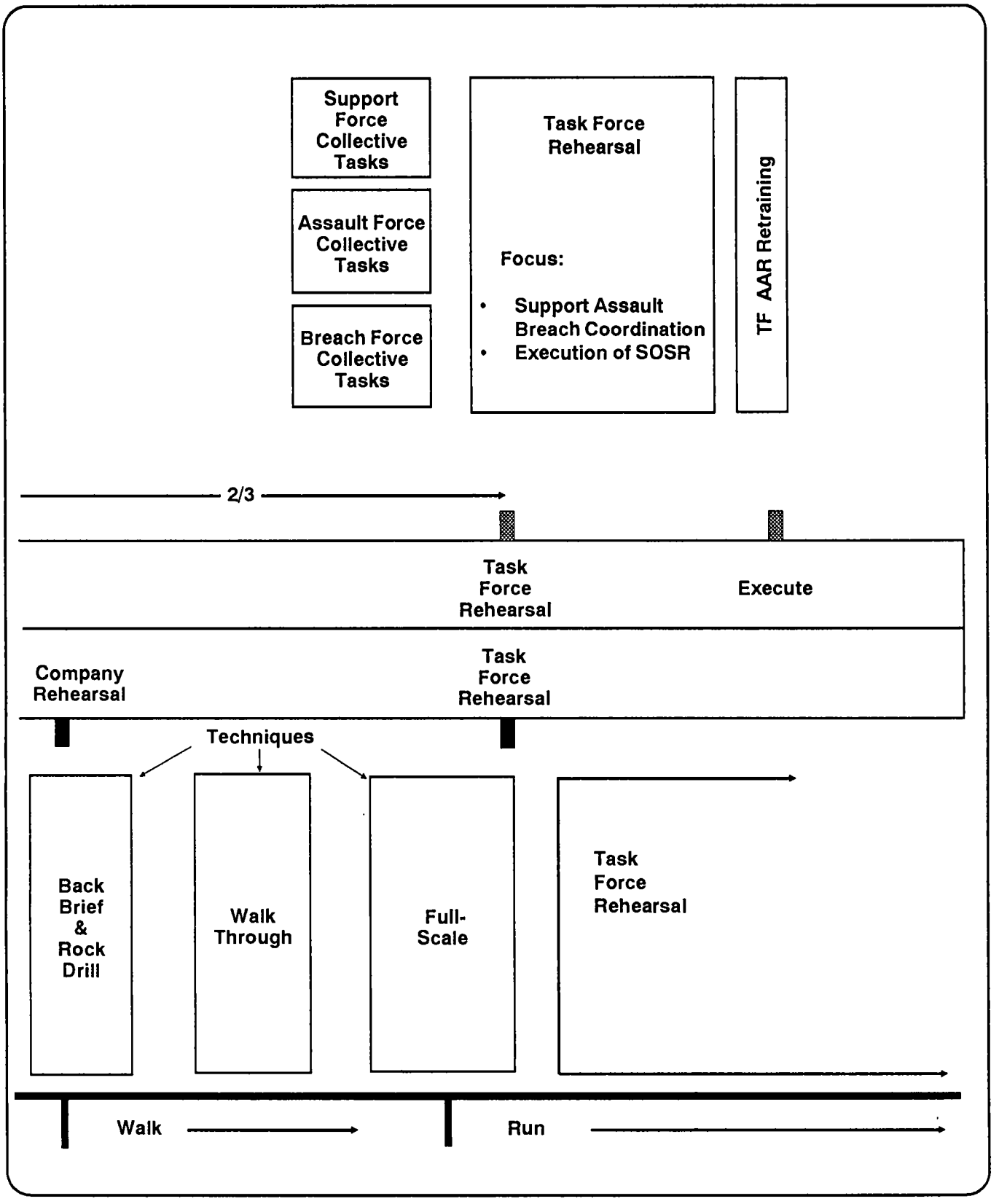


Figure D-7. TF versus company rehearsal time line (continued).

CLASSIFICATION

TO: Orders Group B

FROM: Cdr, TF Armor

SITUATION: One MRC defends vicinity ZZ123456, as a part of an MRB's hasty defense. The MRC's composition is 10 BMPs and 3 T72s. Reports indicate that tactical and protective obstacles are currently being constructed.

ATTACHMENTS/DETACHMENTS:

Tm Falcon	Tm Hawk	Tm Talon	Tm Eagle	Tm Castle
B/3-25AR(-)	A/3-25AR(-)	C/3-3MECH(-)	D/3-3MECH	A/52ENGR(-)
3/C/3-3	1/E/3-3	3/B/3-25	3/A/3-25	2/C/3-3
			3/A/52	

REHEARSAL TECHNIQUE: Rock drill LEVEL: 3

TASKS:

Major rehearsal task: Conduct a deliberate breach
Tm Falcon: Support force
Tm Hawk: Support force, B/P assault
Tm Talon: Support force
Tm Eagle: Assault force
Tm Castle: Breach force

Secondary task: Actions on OBJ Steel
Tm Falcon: 0/0
Tm Hawk: B/P
Tm Eagle: 0/0

TIME/PLACE OF REHEARSAL: 011000Z JAN 91/ZZ001009

ADMINISTRATIVE/LOGISTIC INFORMATION: N/A

Figure D-8. TF rehearsal warning order.

soup cans (as mines), and engineer tape, adding more realism for the rehearsal. The TF commander states the tasks for the breaching rehearsal as follows:

Gentlemen, there are a few things that I want you to gain from this rehearsal. First and foremost, I want you to understand my intent and focus on my vision of the operation; that is, how and why we are doing it. Your understanding of how we will look at OBJ Steel, specifically actions on the objective, is critical. The second task is to understand how we are going to synchronize and what your roles are in the deliberate breach at PL Hammer. The S2 and S3 will review the essential aspects of the enemy and friendly situation that drive the conditions and the standards for this rehearsal.

Each team commander moves his vehicle, acting out the scheme of maneuver. At first the unit is hesitant in communicating its actions on the radio. The TF commander stresses the need for to-the-point cross talk among his

companies. In the case of Team Eagle, the commander acts out his tasks. He moves his vehicle as part of the TF formation and highlights his formation and movement down Axis Sword on the net. The Team Eagle commander tells the breaching participants and the TF commander how he is going to move past Assault Position Blue and occupy Assault Position Red, waiting for the signal to move his team into the breach lanes. The TF commander interrupts the Team Eagle commander to discuss the breach synchronization at that phase of the operation. The TF commander discusses the necessary suppression from Team Hawk and Team Falcon before Team Castle is committed to breach three lanes. The TF commander emphasizes that time is critical and that Team Castle and Team Eagle must not hesitate or waste time. He asks the Team Eagle commander how he will know the route to the breach lanes. Team Castle and Team Eagle discuss lane marking, highlighting the far recognition marker and the final approach marker locations (see *Appendix E*). The TF commander directs the Team Eagle commander to send a guide to maintain contact with Team Castle to smooth the passage through the lanes. Team Eagle finishes acting out its scheme of maneuver. The TF commander focuses on fire-control measures and synchronization as the assault force moves forward before Team Falcon discusses its part of the operation. At the end, the TF XO and S3 recommend that the TF rehearse the breach at PL Hammer again. At the completion of the rehearsal, the TF commander conducts an AAR with the participants. The TF commander releases the participants to continue their preparation.

Task Force In-Stride Breach

The TF commander uses essentially the same techniques as those used for the deliberate breach rehearsal; however, the focus is now at the company team level. Understanding the contrast between the two time lines outlined in *Figure D-6, pages D-8 and D-9*, is crucial. The TF warning order still initiates subordinate units to conduct PCIs and PCCs. The similarity between a deliberate breach and an in-stride breach rehearsal ends there.

Initial Rehearsal. The TF rehearsal warning order orients less on the execution of the breach. The synchronization of SOSR and the maneuvering and performance of the support, breach, and assault forces are the subordinate commanders' responsibility. The rehearsal warning order specifies that in-stride breach operations will be one of the tasks rehearsed at the back brief. The rehearsal warning order implies several tasks that a subordinate leader must recognize. This keys subordinate commanders to conduct crew, squad, and platoon drills, focusing on the execution of all the SOSR aspects. This preparation significantly contrasts with the deliberate breach drill preparation, which focused specifically on one or two of the SOSR tasks. The back-brief rehearsal after the TF OPORD brief concentrates on passing combat power through the lanes created by a subordinate force. The transition to a deliberate breach, as a be-prepared task, is synchronized.

Subordinate Rehearsals. For in-stride breach operations, the TF constructs several rehearsal sites. This allows subordinate units to conduct their own breaching rehearsals in the time available. Unlike a deliberate breach, an in-stride breach requires that subordinate commanders organize and control the actions of the support, breach, and assault forces. With this in mind, the TF commander allocates more company preparation time for subordinate breaching rehearsals and less time for TF breaching rehearsals. The extra preparation time is critical for his subordinate commanders to synchronize the execution of SOSR. The TF leader's role is to set up a rotation schedule for breaching rehearsal sites for each unit and to help the subordinate commanders synchronize their breaching operation.

Final Rehearsal. The final TF breaching rehearsal for an in-stride breach is normally a rock drill at Level 3 or lower. As the participants act out the scheme of maneuver, the responsible company commander discusses the in-stride breach. The company commander discusses his breaching operation and the coordination to pass the follow-on forces. The TF commander ensures that he has been allocated enough assets (breaching assets, fires, and combat power) for his in-stride breach. As with the back brief, the transition to the deliberate breach is acted out. The TF commander details the necessary control measures, coordination, and synchronization for a successful transition. The breaching rehearsal ends with an AAR.

Appendix E
Breach Lane Marking

This appendix provides commanders with an Armywide standard system for breach lane and bypass marking. It centers around a systematic, phased upgrade of lane marking. Each upgrade conforms to the tactical requirements for that phase of the attack, from initial reduction of the obstacle to the passage of larger follow-on forces as well as the return traffic necessary to sustain the force.

Marking the breach lane or bypass is a critical subcomponent of obstacle reduction. Effective lane marking allows the commander to project forces through the obstacle quickly, with combat power and C^2 intact. It gives the assault force confidence in the safety of the lane and helps prevent unnecessary minefield casualties.

There are two critical components to any lane-marking system. They are the—

- Lane-marking pattern (the location of markers indicating the entrance, the lane, and the exit).
- Marking device (the type of hardware emplaced to mark the entrance, the lane, and the exit).

The lane-marking system outlined in this appendix centers around standardizing the marking pattern across the Army rather than standardizing the marking device. Standardizing the marking pattern is critical to offensive operations. A common lane pattern—

- Enables cross attachments and adjacent units to recognize breach lanes easily with minimal knowledge of a particular unit's tactical SOP.
- Gives all forces a standardized set of visual cues needed to pass through a lane safely and maintain their momentum.
- Facilitates quick conversion to the lane-marking requirements of Standardized Agreement (STANAG) 2889 (see *Figure E-8, page E-14*).

Until the Army adopts a standard lane-marking device, the commanders decide what hardware to use. This gives units a greater flexibility, allowing them to adopt a marking device tailor-made for their type of unit and operations focus (such as an armored or light force, mounted or dismounted attack, limited visibility, thermal capability); however, regardless of the type of device used, it must support the standard lane-marking pattern outlined in the following paragraphs. Therefore, commanders should consider the marking device guidelines and examples in this appendix before developing or adopting their own system. Theater-level commanders should determine and standardize the device used based on the availability of resources and METT-T.

LANE-MARKING TERMS

The following defined terms provide a common basis for discussing lane marking:

- Entrance markers.
- Handrail markers.
- Exit markers.
- Entrance funnel markers.
- Final approach markers.
- Far recognition markers.
- Guides and traffic control posts.

Entrance Markers

Entrance markers indicate the start of a reduced lane through an obstacle. They signify the friendly side limit of the obstacle(s) and the point at which movement is restricted by the lane width and lane path. Entrance markers also indicate the width of the reduced and proofed path. Therefore, it is critical for the maneuvering force to distinguish the entrance point clearly, since it signifies the point at which passing vehicles can no longer adjust their movement in reaction to the situation (such as direct and indirect fire) without jeopardizing the force. Entrance markers must be visually different from handrail markers to help the force distinguish this critical point in the lane. The distance between entrance markers must be the same as the width of the reduced lane. Entrance markers placed a minimum of 4.5 meters apart indicate a lane capable of supporting mounted movement, while markers placed a minimum of 1 meter apart indicate a dismounted lane. When obstacle limits are vague or unknown (such as a buried minefield), the breach force uses its best judgment and marks the entrance wherever obstacle reduction and lane proofing begins.

Handrail Markers

Handrail markers define the lane path through the obstacle as well as indicate the limits of the lane width. As a minimum, mounted and dismounted lanes will have a left handrail. Mounted and dismounted forces moving through the lane should keep the left handrail immediately to the left of their vehicle or person. The lane width is defined by the

entrance markers. Therefore, when only the left handrail is marked, drivers use both the entrance and handrail markers to gauge the lane width and lane path. As the operation progresses, lane marking may be upgraded to include both left and right handrails.

Exit Markers

Exit markers indicate the far side limit of the reduced lane through an obstacle. For the passing force, the exit signifies the point at which movement is no longer confined to the lane path. Like entrance markers, exit markers must be distinguishably different from handrail markers; however, the exit may be marked the same as the entrance. Exit markers are placed to the left and right of the exit point and spaced the width of the reduced lane. This visual reference is critical when only the left handrail is marked. The combination of entrance markers, left handrail markers, and exit markers gives the driver and tank commander the visual cues (entrance and exit points, lane width, and lane path) to pass safely through a reduced lane.

Entrance Funnel Markers

Entrance funnel markers augment entrance marking. They assist the small-unit commander in guiding the lead element of his combat column formation. As the platoons approach the funnel markers, they move into column formation. The V formed by the funnel markers forces the platoon into a column and assists drivers and tank commanders in making last-minute adjustments before entering the lane.

Final Approach Markers

A final approach marker is a highly visible, more robust marker that augments the visual signature of entrance funnel markers. The final approach marker is critical when initial assault forces must maneuver to the breaching site. Normally, the initial assault force can observe the breaching area but cannot clearly distinguish entrance funnel markers. The final approach marker—

- Provides the assault force commander with a highly visible reference point toward which to maneuver his formation.
- Signals company team commanders to begin changing from combat column to column formation, with platoons in combat column.

Far Recognition Markers

A far recognition marker is a highly visible marker located between the final approach marker and the friendly unit. It is primarily used when passing battalion-size forces through a lane where distance, visibility, or terrain do not allow the passing force direct observation of the final approach marker. When possible, far recognition markers should be different from the final approach marker. The far recognition marker indicates the point at which forces begin changing their formation to posture for the passage. The far recognition marker triggers company teams to change to combat column formation. A single far recognition marker may serve up to two initial breach lanes when located 200 to 400 meters apart. Normally, one far recognition marker will not serve more than two lanes unless all the lanes of that breaching site are within a 500-meter front. Once lanes are upgraded to two-way traffic, far recognition markers are required for each two-way lane. Far recognition markers should be visually alterable so they can be distinguished from the far recognition marker of an adjacent lane(s). This assists the C^2 of large formations when passing on several adjacent lanes. When a far recognition marker serves more than one lane, a guide or traffic control post (TCP) is collocated with the far recognition marker nearest to the breach.

Guides and Traffic Control Posts

A TCP or guide is a two-man team with communications means that assists the commander in controlling the movement of forces. When possible, military police (MP) should man TCPs. Initially, however, the commander may use other personnel as guides to man critical far recognition markers until MPs establish full TCPs. TCPs and guides provide the commander with a man on the ground to control traffic flow to appropriate lanes. When there are multiple lanes branching off a single far recognition marker, the TCP can assist in breaking parts of the formation off to various lanes. The TCP can also assist in modifying the traffic flow when lanes have been closed for maintenance or lane expansion or by enemy scatterable mines. The guide or TCP must give the assault force commander the azimuth and distance to the final approach marker, the device used for the approach marker, and the level of the lane-marking pattern. For light forces, guides may physically escort passing units from the far recognition marker to the lane entrance. In short, the TCP gives the commander the ability to make last-minute changes in the traffic flow, thereby giving him increased flexibility to react to the enemy situation.

LEVELS OF LANE MARKING AND PATTERNS

There are three standard levels of marking for breach lanes and bypasses:

- Initial.
- Intermediate.
- Full.

Each lane-marking level provides an increase in lane signature and capability. Lane requirements change as a breaching operation matures from initial breach to the forward passage of large combat forces. Initial lane-marking requirements are driven by the nature of the fight through the

obstacle. Marking must be rapid, providing only the bare minimum signature needed to pass small units (company teams and platoons) that make up the initial assault force through the obstacle. This contrasts with the lane requirements of later phases of an offense where larger units (battalion and above) are passed to subsequent objectives. Here, the lane signature must be more extensive and more visible. Lane marking must now guide larger forces over a greater distance to the lane's entrance without interruption. Two-way traffic becomes a priority for the simultaneous forward passage of combat units as well as the return traffic (such as ambulances and empty supply vehicles) necessary to sustain the force. With the increase in traffic volume comes more diverse forces and levels of driver experience. Lane-marking limits must be absolutely clear to the most inexperienced driver or crewman. Do not assume they have a knowledge of unit SOPs. A fully developed lane must support two-way traffic and be completely marked.

Bypasses are marked using the same lane-marking patterns, marking devices, and visual cues as any other lane. The only time there is special consideration for bypass marking is when it is expanded to support two-way traffic. While lanes through an obstacle are normally expanded to the left, bypasses are expanded away from the obstacle to minimize the effort involved in expansion.

Commanders must be aware of how the lane needs of the force change with the operation so they can anticipate lane-marking and lane-capability requirements. Integrating the levels of lane marking into the overall breaching plan ensures that the unit's needs are satisfied. Forces necessary to mark and upgrade lanes must be allocated and tasked with the mission. The phases of the scheme of maneuver and service support plan are the basis for analyzing lane requirements. The following paragraphs describe lane-marking patterns in detail and provide guidelines on when the commander should upgrade lane marking and lane capability.

Initial Lane Marking

The initial lane-marking pattern is emplaced by the breach force immediately after the lane is reduced and proofed. It signals to the assault force commander that the lane is ready for traffic to pass through. Initial lane marking is kept to a minimum, centering on those markings needed to pass immediate assault forces (company teams and smaller) through the lane to seize the initial foothold on the objective. Normally, the assault force can observe the breach and does not need the more visual signature of a mature lane marking. The initial lane-marking pattern has the following components:

- Entrance markers.
- Left handrail.
- Exit markers.
- Entrance funnel.
- Final approach marker.

To ensure that the most critical components of lane marking are emplaced first, use the sequence described in the following paragraphs. *Figure E-1, page E-4* illustrates the initial lane-marking pattern.

The entrance, left handrail, and exit markers are the first markers emplaced by the breach force since they define the location and limits of the reduced lane. The entrance markers are placed to the left and right of the reduced lane's.entrance point. Entrance markers are spaced the width of the lane (4.5 meters for mounted lanes, 1 meter for dismounted lanes). Left handrail markers are placed at the left limit of the lane along the entire path. Handrail markers are placed at 15-meter intervals for mounted forces and 5-meter intervals for dismounted forces. Commanders may have to modify the intervals based on terrain, visibility, lane length, and lane path. Additionally, commanders may choose to mark both left and right handrails when the lane path is lengthy or unclear (for example, through a complex obstacle). Exit markers are placed to the left and right at the end of the reduced and proofed lane.

Once the entrance, left handrail, and exit markers are placed, the breach force emplaces the entrance funnel markers and the final approach marker. These markings enhance the visual signature of the lane entrance for the assault force. If the assault force is in a position to observe the obstacle reduction, the commander does not have to wait until the entrance funnel marker and the final approach marker are set to commit the initial assault force; however, the breach force continues to install the necessary markers to improve the lane signature for larger or subsequent follow-on forces maneuvering toward the lane. Funnel markers are placed at 15-meter intervals (5 meters for dismounted forces), diagonal to the lane entrance, to form a 45-degree V as shown in *Figure E-1, page E-4*. For mounted forces, the final approach marker is centered on the lane and placed at least 200 meters from the lane entrance. For dismounted forces, the nature of the attack may preclude using a final approach marker initially; however, as soon as the mission allows, it is placed 30 meters from the entrance. The commander may modify the recommended distance for the final approach marker based on the terrain and visibility.

Intermediate Lane Marking

Upgrading initial lane marking to the intermediate pattern is triggered by one of two key events: commitment of larger combat forces unable to directly observe the breach or the rearward passage of sustainment traffic (casualty evacuation and vehicle recovery). Intermediate lane marking has two goals. It—

- Increases the lane signature to assist in the passage of larger, more distant combat forces.
- Provides sufficient marking for two-way, single-lane traffic.

Intermediate lane marking builds on the initial lane pattern by adding right handrail markers, exit funnel markers, far recognition markers, and a far side final approach marker. *Figure E-2* shows the intermediate lane-marking pattern.

The commander sets the priority of marker emplacement based on the situation. If the scheme of maneuver requires the immediate passage of larger combat forces, the right handrail markers and the far recognition marker may be the priority. On the other hand, if it is necessary to ground evacuate casualties or to recover vehicles, it may require emplacing right handrail markers, exit funnel markers, and a far side final approach marker first. Intermediate lane marking gives the commander greater flexibility. For instance, with the initial foothold seized, a commander may be driven to upgrade all four breach lanes to the intermediate lane-marking pattern. This enables him to pass a follow-on TF on three lanes while using the fourth lane for his own sustainment traffic. Establishing a network of guides becomes increasingly important to direct the flow of forward and returning forces.

Regardless of the reason for an upgrade, the first step is to emplace the right handrail markers. Right handrail markers define the rightmost limit of the reduced and proofed lane. They are placed the width of the lane as defined by the

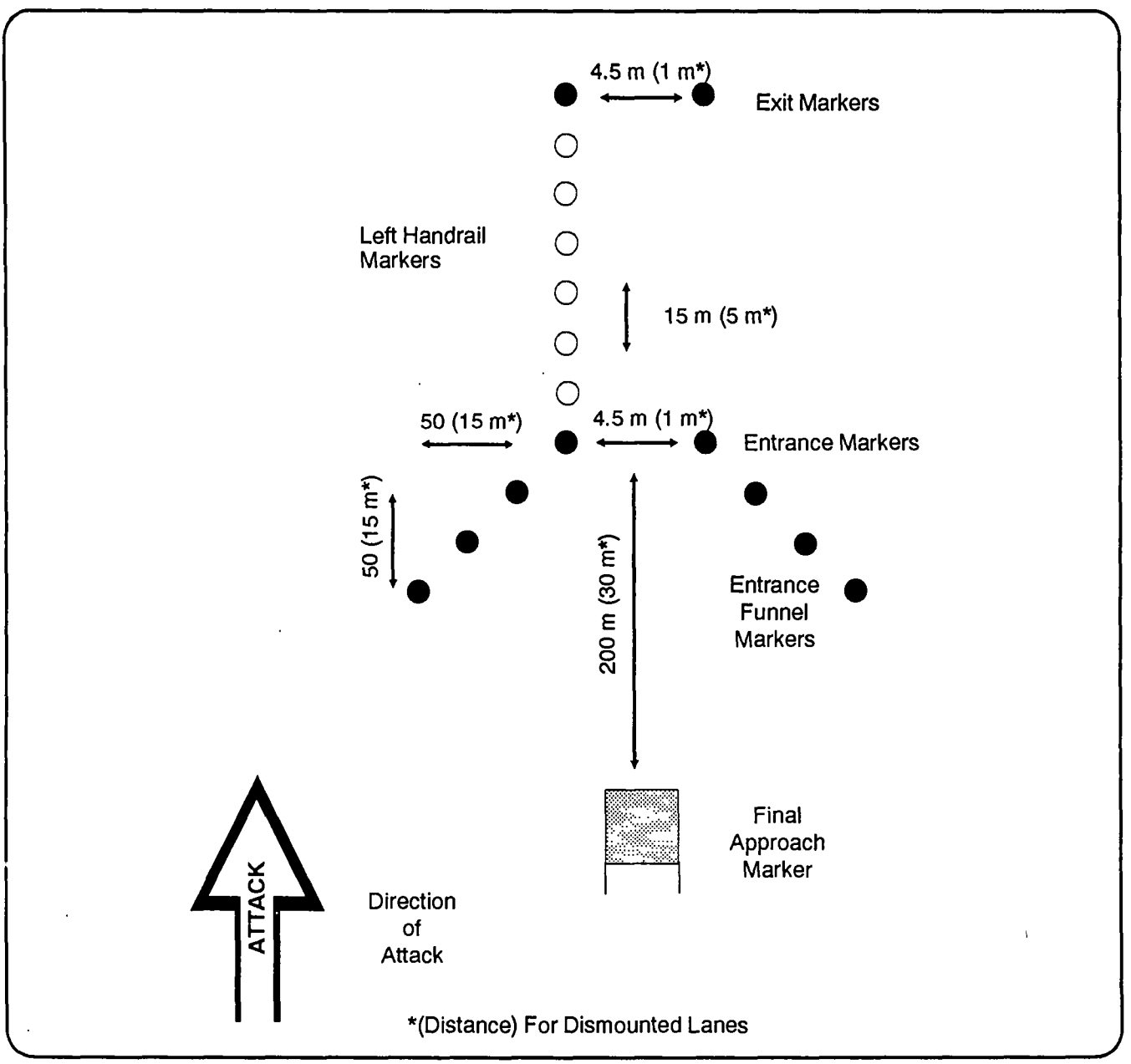


Figure E-1. Initial lane-marking pattern.

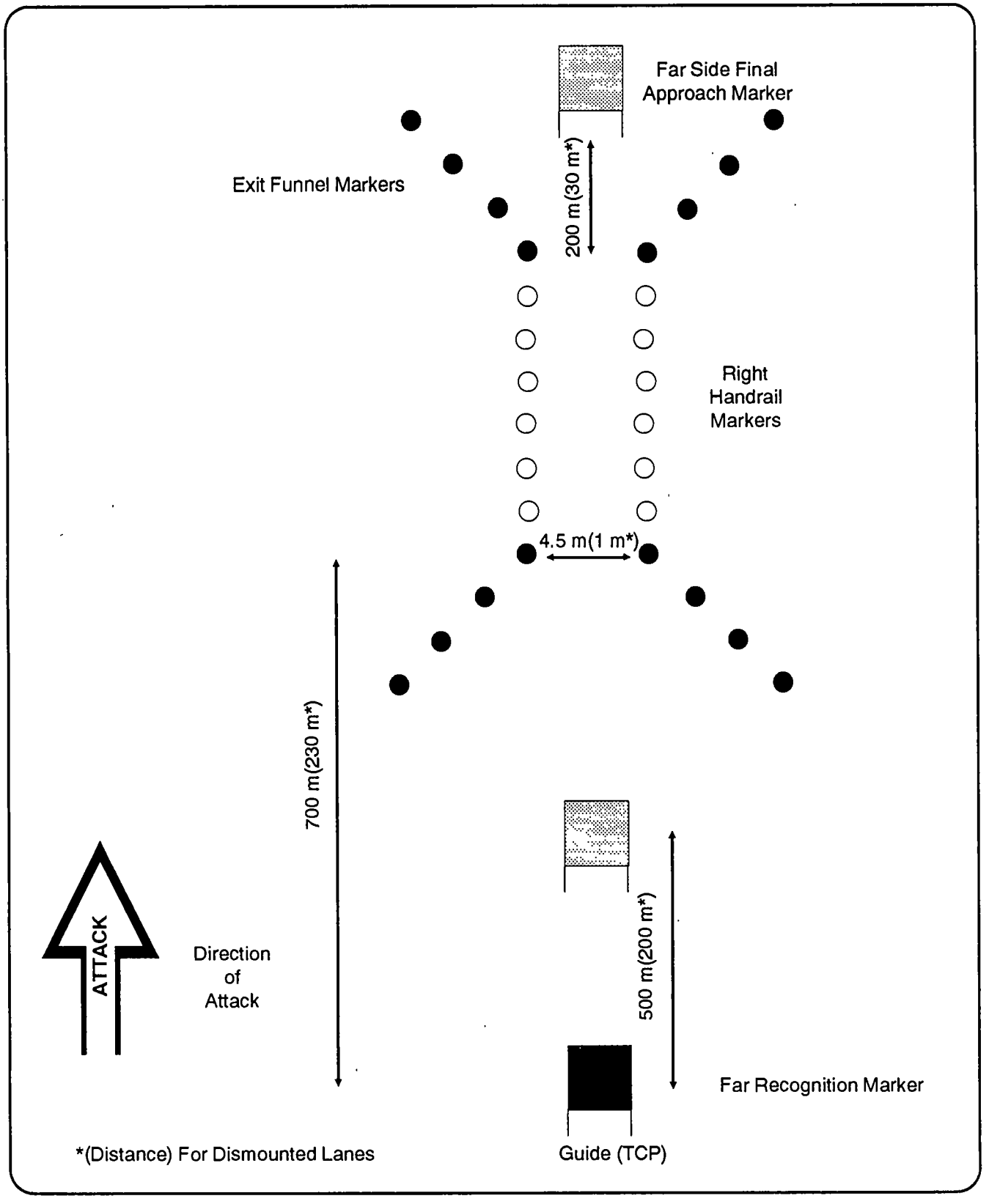


Figure E-2. Intermediate lane-marking pattern.

entrance and exit point markers. The right handrail follows a path parallel to the left handrail through the obstacle. Right handrail markers are placed at the same interval as left handrail markers.

Exit funnel markers and a far side final approach marker are emplaced to mirror the entrance markers. Exit funnel markers serve two functions. For the forward passage of large combat forces, they prevent the premature deployment of the passing force into combat formation before they are safely outside the obstacle. They also become the entrance funnel markers for rearward passing traffic, giving these forces the visual cues needed to line themselves up on the lane. The exit funnel markers are augmented by a far side final approach marker to help rearward-passing forces to clearly identify the lane from their side. The far side final approach marker is centered on the lane and placed 200 meters (30 meters for dismounted forces) from the exit (far side entrance).

A far recognition marker completes the intermediate lane-marking pattern. It provides commanders of larger combat formations with a visual signature, or series of signatures, on which to guide their movement toward the lane(s). When the assault force is moving over a greater distance to the lanes, additional far recognition markers may be required. For mounted forces, the far recognition marker nearest to the breach lane is placed 500 meters from the lane entrance or on the nearest terrain feature. Again, dismounted forces may require a system of guides instead of far recognition markers for passing combat forces; however, far recognition markers must be emplaced as soon as possible to reduce guide requirements for passing mounted sustainment traffic. This gives the assault force commander the space needed to transition his formation to companies in combat column. Far recognition markers may be emplaced before or concurrent with exit markers based on the mission and situation.

The commander collocates guides or TCPs at the far recognition marker when he feels the situation requires more positive control over traffic flow. Normally, the need to increase traffic control comes at the same time as the need for limited two-way traffic and intermediate lane marking. Commanders should plan for the use of full-time guides once they have upgraded to intermediate level marking. Guides or TCPs become mission critical during limited visibility or in restrictive terrain. They should also be used when a single far recognition marker feeds more than one breach lane. TCPs must be manned with a minimum of two soldiers and must have FM communications with the controlling headquarters. It is essential that soldiers acting as guides or TCPs know the—

- Azimuth and distance to the breach lane(s).

  or

  The 8-digit grid coordinate of the lane that is entered into the unit's Global Positioning System (GPS).
- Level of lane marking.
- Type of final approach marker used.
- Traffic control plan and march order.

Guides must be kept up-to-date on the status of lane marking, maintenance, and so forth.

Full (Two-Way) Lane Marking

Expanding breach lanes to full lane marking is resource intensive and is normally not part of an initial breaching operation. A fully matured lane is one that will support uninterrupted two-way traffic. Expanding a breach lane to a full lane involves—

- Expanding the width of the lane to accommodate two-way traffic.
- Modifying the marking pattern to give forces passing forward or rearward the same visual signature.

Upgrading to a full lane is normally assigned to follow-on engineer forces, since it is usually beyond the immediate capability of engineers with forward units. In special cases, the commander may be forced to task engineers with forward units to expand and upgrade from intermediate to full lane marking; however, the trade-off is decreased support to forward units and delays associated with changing task organization. The full lane-marking pattern is also used when marking a lane through friendly obstacles along a major supply route or passage lane.

Upgrading an intermediate lane-marking pattern to a full lane begins by temporarily closing the lane, rerouting traffic, and expanding the lane width. The initial reduced and proofed lane is always expanded to the left in relation to the direction of the attack. Engineers reduce and proof the obstacle beginning at the left handrail to give a total lane width of 10 meters (5 meters each way). The expansion width requirement is the same for armored and light forces since both forces must be able to pass mounted sustainment and combat forces during this phase. When the lane is expanded through mechanical means, it is necessary to entirely remove the left handrail markers during expansion. Whenever possible, these markers should be left alone to serve as a reference point during lane expansion. If removed altogether, the left handrail must be replaced since it forms the left handrail for both forward and rearward passing forces.

Once the engineers expand the lane width to 10 meters, ensure that the entrance, exit, right handrail, funnel, and final approach markers are replaced on the return lane. All markings are the same as described in previous paragraphs. *Figure E-3* shows a full lane-marking pattern. The full lane-marking pattern has three entrance and three exit markers. Entrance and exit markers are placed the width of forward and return lanes and are visually different from other markers. Units must be trained to recognize that three entrance markers indicate a two-way traffic lane and that

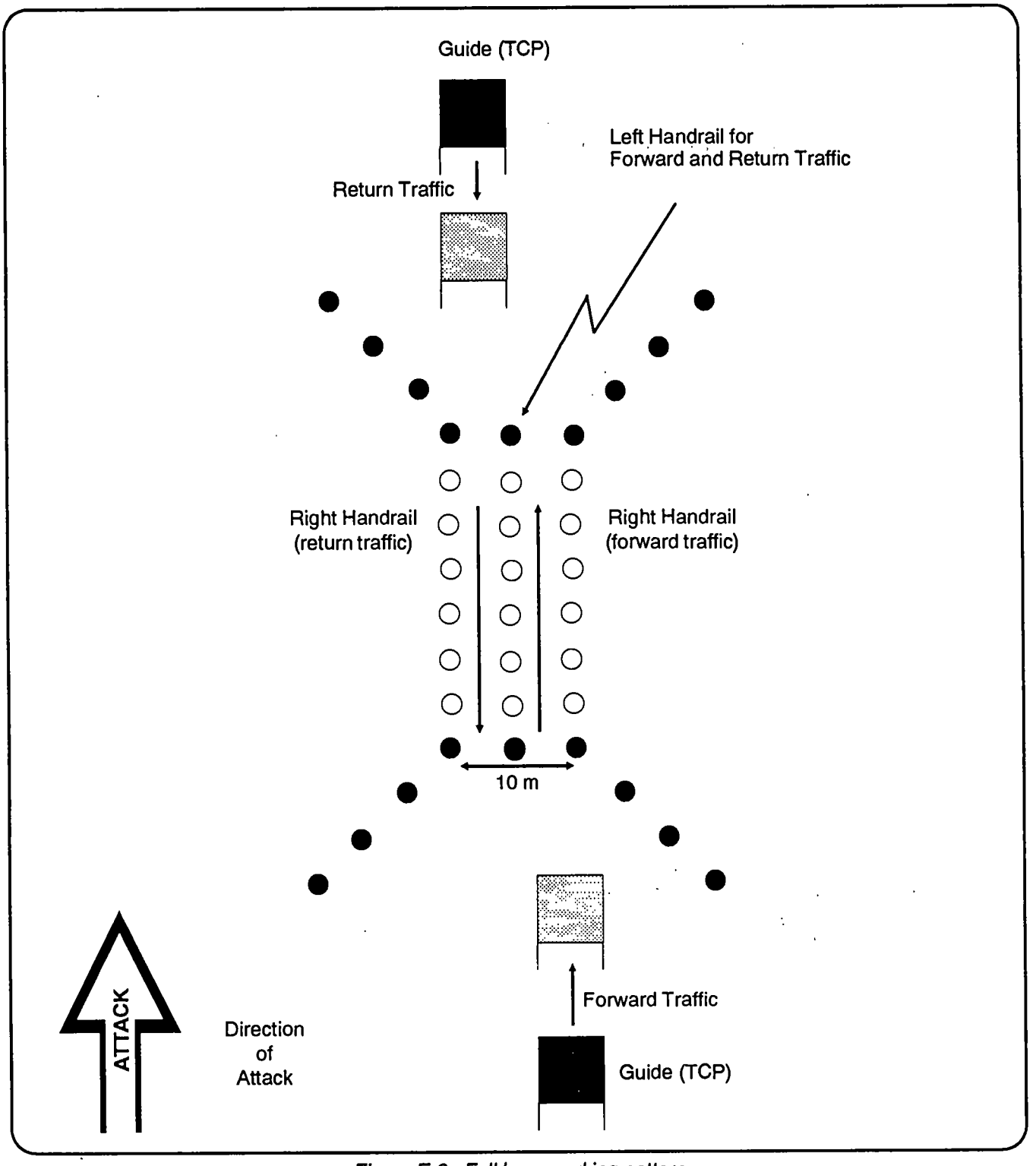


Figure E-3. Full lane-marking pattern.

they should always use the rightmost lane. Entrance and exit funnel markers are placed slightly different from previous marking patterns. In the full lane-marking pattern, funnel markers extend out from the entrance and exit markers on the right side only. Final approach markers are placed 200 meters from and centered on entrances of forward and return lanes. This assists forces in clearly identifying the entrance points from either direction. Far

recognition markers are placed a maximum of 500 meters from the lane entrance or the nearest terrain feature from forward and return final approach markers. Again, distances may be modified based on the terrain, the visibility, and the mission.

Commander's Guidance for Lane Marking

Table E-1 gives the commander a summary of lane-marking levels, guidelines on unit responsibilities, and events that trigger lane upgrade. The chart focuses on TF-level operations. For instance, the description of a deliberate breach assumes a TF deliberate breach. In the table, "who" refers to the unit responsible for lane upgrade marking, and the "when" describes events that trigger the need to upgrade. "Markers" highlight a quick reference for lane-marking requirements.

MOVEMENT THROUGH THE LANE

The standard lane patterns help the commander in two critical aspects of moving a unit through a lane(s):

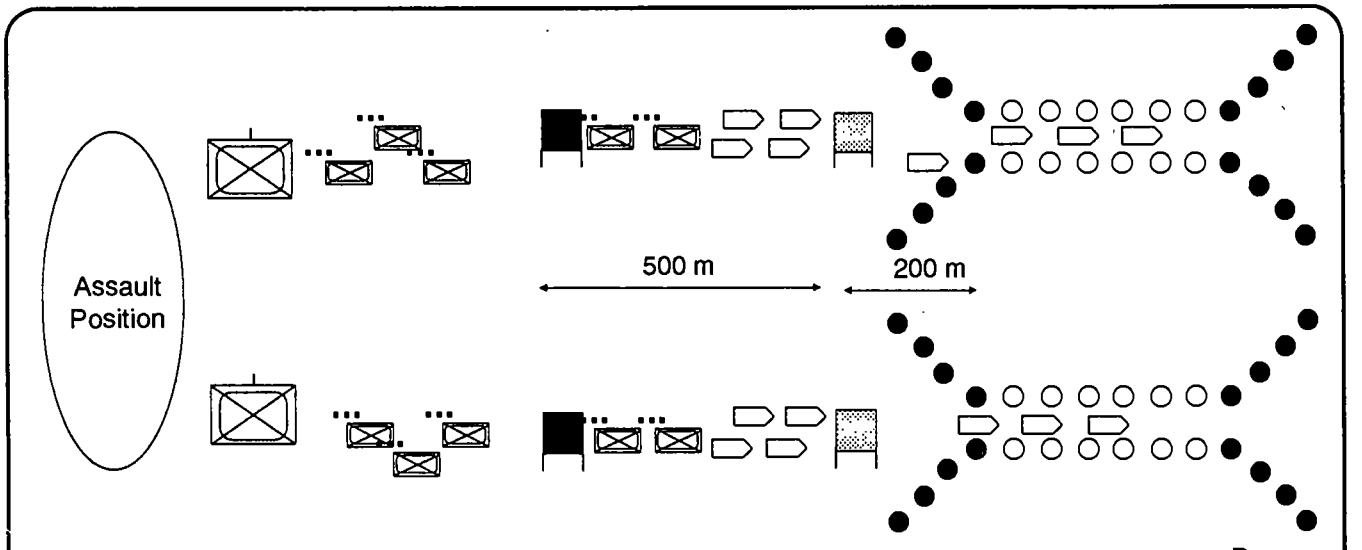
- The lane markers help the force posture its formation for efficient passage through the defile that is caused by the lanes through an obstacle.
- The combination of lanes and TCPs gives the commander greater flexibility in the forward and rearward movement of forces.

Table E-1. Lane-marking levels, unit responsibilities, and trigger events.

	Breach Type	Initial	Intermediate	Full (2-Way)
Who	Deliberate	TF breach force	TF breach force	Brigade
	Covert	TF breach force	TF breach force	Brigade
	In-stride	Breaching company or team	TF mobility reserve	Brigade
	Assault	Assaulting platoon	TF assault force	NA
When		• Lanes are reduced • Passing platoon- or company-size assault forces	• Passing battalion- or company-size forces • Passing a force which cannot see the lane • Passing TF combat trains	• Passing brigade- or battalion-size forces • Situation requires uninterrupted sustainment traffic
Markers		• Entrance/exit • Left handrail • Funnel entrance • Final approach	• Add: – Right handrail – Funnel exit – Far side final approach – Far recognition – Guides/TCPs	• Expand lane width to 10 meters • Adjust: – Entrance/exit – Left/right handrails to new width – Final approach • Add: – Far side recognition – Far side guides/TCPs

Far recognition and final approach markers in the standard lane-marking pattern help commanders of assault forces to change from combat formation to column formation smoothly before passing through the lane(s). In most cases, the situation should allow a unit to move in column formation from the outset; however, the enemy situation and terrain may demand that forces remain dispersed as long as possible. Far recognition, final approach, and entrance funnel markers are used to trigger commanders to alter their formations. *Figure E-4* illustrates how formations at various levels must change to efficiently pass through the lanes. The battalion TF initially moves from its assault position in a box, V, or wedge formation depending on the number of lanes being used. Initially, company teams and below may move in any combat formation. Once lead elements of the battalion visually identify the far recognition marker, company teams begin moving to combat column formation with platoons still deployed. Platoons change to combat column formation as they move from the far recognition marker to the final approach marker. Platoons change to column formation as they move from the final approach marker to entrance markers, using the entrance funnel markers as guides. Platoons redeploy once they pass through the exit or exit funnels.

As the attack progresses, commanders should upgrade lane marking and establish traffic control as early as METT-T will allow. The combination of upgrading lanes from the



	Move Out of Assault Position	Visually Identify Far Recognition Marker	Pass Far Recognition Marker	Pass Final Approach Marker	Pass Through Exit Funnel Markers
Battalion	Box (2 lanes) V (3 lanes) Wedge (3 lanes)	Box (2 lanes) V (3 lanes) Wedge (3 lanes)			Resume formation
Company	Any combat formation	Combat column	Column	Column	
Platoon	Any combat formation	Any combat formation	Combat column	Column	

Figure E-4. Formation changes based on lane markers.

initial marking pattern and establishing TCPs gives the commander greater flexibility. Normally, TCPs are established at forward and return far recognition markers. Upgrading to a full lane capable of supporting uninterrupted two-way traffic is generally determined by the need to pass increased volumes of traffic. Consequently, the commander will need the increased control of traffic flow that TCPs afford him. TCPs at both far recognition markers become manpower intensive and require manpower dedicated to the task of traffic control.

Figure E-5 illustrates the flexibility that the combination of full lane marking and TCPs provide the commander. In this example, the force has reduced two lanes within 200 to 400 meters of each other at breaching site Red. Lane Red 1 is a full lane while lane Red 2 is marked to an intermediate level. One far recognition marker on the near and far sides can feed both lanes. The full lane marking and TCPs give the commander the ability to continue pushing combat power forward on lanes Red 1 and 2. At the same time, the far side TCP directs all return traffic to the lane Red 1.

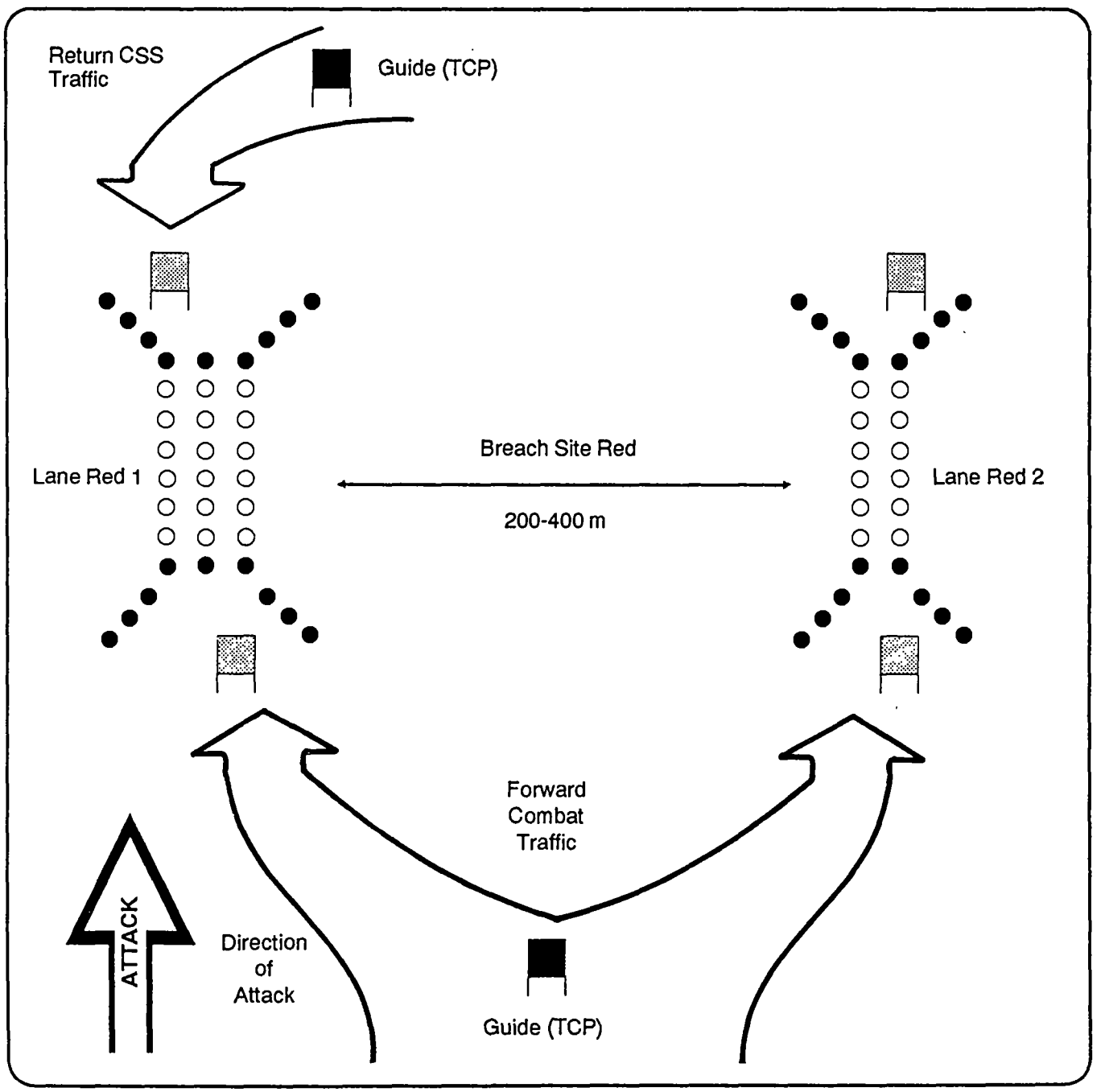


Figure E-5. Multiple lanes used at different levels.

LANE-MARKING DEVICES

Currently, the Army has no standard lane-marking device. Commanders recognize that the marking systems in the Army supply system do not meet the operational requirements of modern warfare. Those systems are the—

- Hand-Emplaced Minefield Marking System (HEMMS); national stock number (NSN) 9905-01-019-0140.
- Minefield Marking Set #2; NSN 9905-01-019-0140.
- CLAMS; NSN 2590-01-205-3082.

The majority of lane marking in the field is done using nonstandard marking devices. Before adopting a nonstandard marking device, commanders should consider the guidelines summarized in *Table E-2*.

Figure E-6, page E-12 shows some of the devices currently used by units to make up for shortcomings in the supply system and that are easily procured or fabricated. This is by no means a complete listing; rather, it is intended to show commanders some of the options.

Some of the general requirements for lane marking are as follows:

- Markers must be able to withstand the rigors of the terrain, the weather, and the battlefield.
- Markers should be easy to modify when visibility is limited, with minimal addition of manpower and equipment.
- Enhancements for limited visibility should be a constant source rather than a pulsating strobe. Strobes do not make the marking pattern readily apparent, particularly when approaching from an angle.

NORTH ATLANTIC TREATY ORGANIZATION (NATO) STANAG MARKING REQUIREMENTS

The following paragraphs paraphrase the breach lane-marking requirements outlined in NATO STANAG 2889. It also establishes the procedures used by US forces to modify intermediate and full lane-marking patterns to STANAG

Table E-2. Guidelines for lane-marking devices.

Marker	Mounted Forces	Dismounted Forces
Handrail and funnel markers	• Visible by tank commander (TC) and driver buttoned up from 50 meters • Quick and easy to emplace, minimizing the need to expose soldiers outside the carrier	• Visible by a dismounted soldier in a prone position from 15 meters • Lightweight, quick and easy to emplace; a dismounted soldier should be able to carry enough markers for the lane and still be able to fire and maneuver
Entrance and exit markers	• Visible by TC buttoned up from 100 meters • Visually different from handrail and funnel markers • Quick and easy to emplace; may require soldiers to dismount to emplace • Easily man portable	• Visible by a dismounted soldier from 50 meters • Visually different from handrail and funnel markers • Lightweight, quick and easy to emplace
Final approach and far recognition markers	• Visible by TC (not buttoned up) from 500 meters • Visually different from each other • Visually alterable to facilitate traffic control through multiple lanes	• Visible by a dismounted soldier on the march from 100 meters • Visually different from each other • Visually alterable to facilitate traffic control through multiple lanes

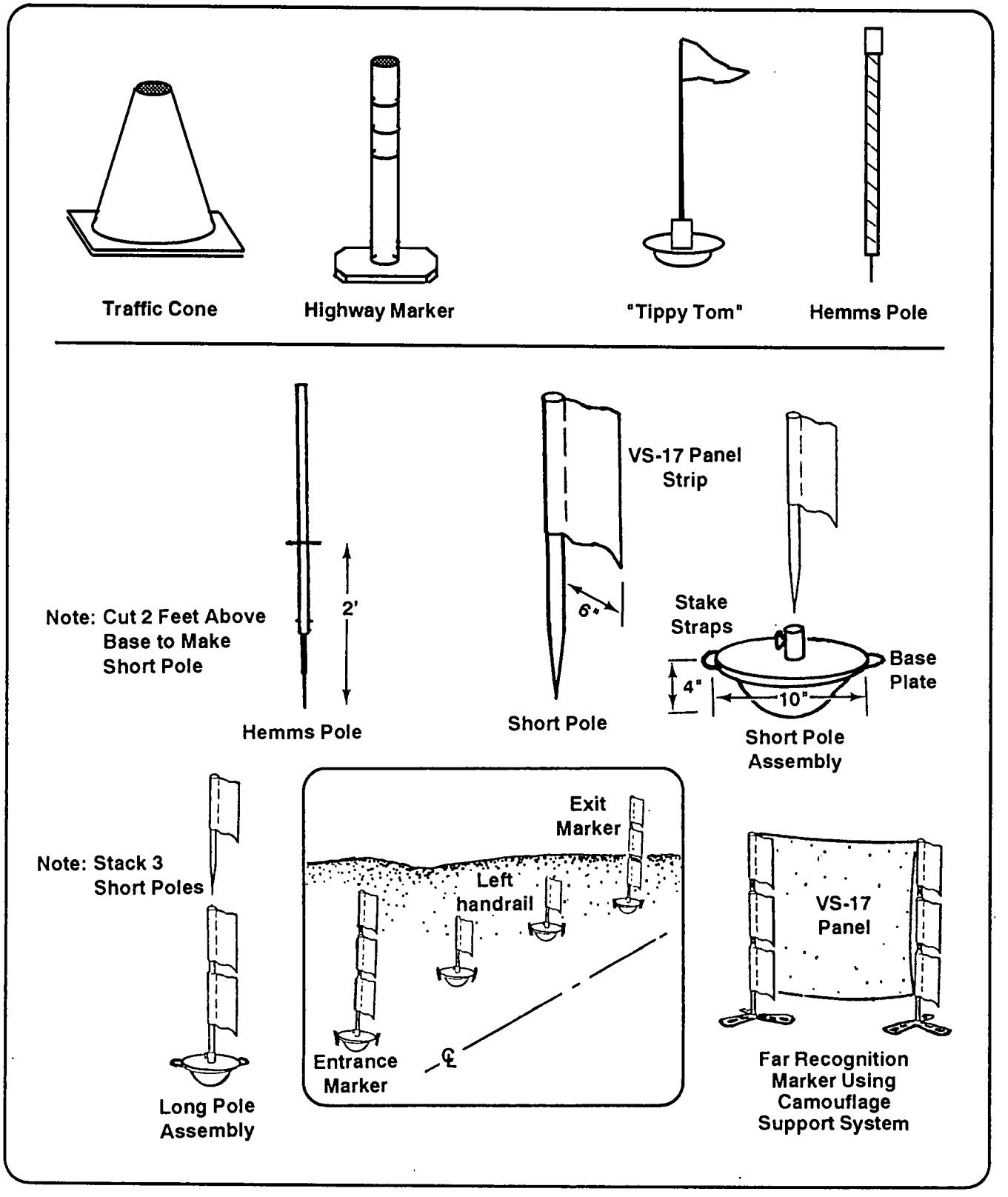


Figure E-6. Examples of nonstandard marking devices.

standard. The trend in modern warfare is increasingly toward combined operations. With the increased combined nature of warfare, commanders need to be aware of their responsibilities under NATO STANAG for marking hazardous areas, particularly breach lanes.

The following paragraphs implement STANAG 2889.

Commanders' Responsibilities Under NATO STANAG

STANAG 2889 states that the type of marking device, pattern, and lighting used to mark breach lanes in forward areas is at the discretion of national authorities or the authorized commander. This gives commanders participating in a combined operation the flexibility to mark lanes consistent with their respective Army's standard. It also outlines minimum requirements for the lane-marking pattern before it is used by troops of other nations; however, commanders must plan for converting a lane to NATO standard as early as possible. When converting to NATO standard, the STANAG directs commanders to use lane-marking devices as stated below. Within an offensive operation, this will normally not occur until the lane is matured to a full lane as described previously.

NATO STANAG Marking Pattern and Device

The intermediate lane-marking pattern discussed earlier satisfies the minimum lane-marking pattern that must be used before forces from another country are to pass through a lane. STANAG 2889 states that regardless of the marking device used, the lane entrance point, exit point, and left and right handrail are the minimum required lane signature. Furthermore, the STANAG requires that the entrance and exit of a lane be distinguishably different from other markers and that handrail markers be placed at intervals no greater than 30 meters. These requirements are met once lane marking is upgraded to the intermediate or full level. Therefore, once the lane is marked to the intermediate level, commanders can use the lane for allied forces to pass through without any additional marking.

STANAG 2889 requires that commanders convert marking devices to NATO standard as early as possible. *Figure E-7* shows a NATO standard marking device. Minefield Marking Set #2 contains enough NATO markers and lights to mark 200 meters of lane; however, the set does not contain the long pickets and barbed wire necessary to emplace the full NATO standard marking. The NATO standard marker is placed at right angles to the direction of travel. It is placed so the white portion of the arrow points inward to the lane indicating the safe side on which to pass. The red portion is outward

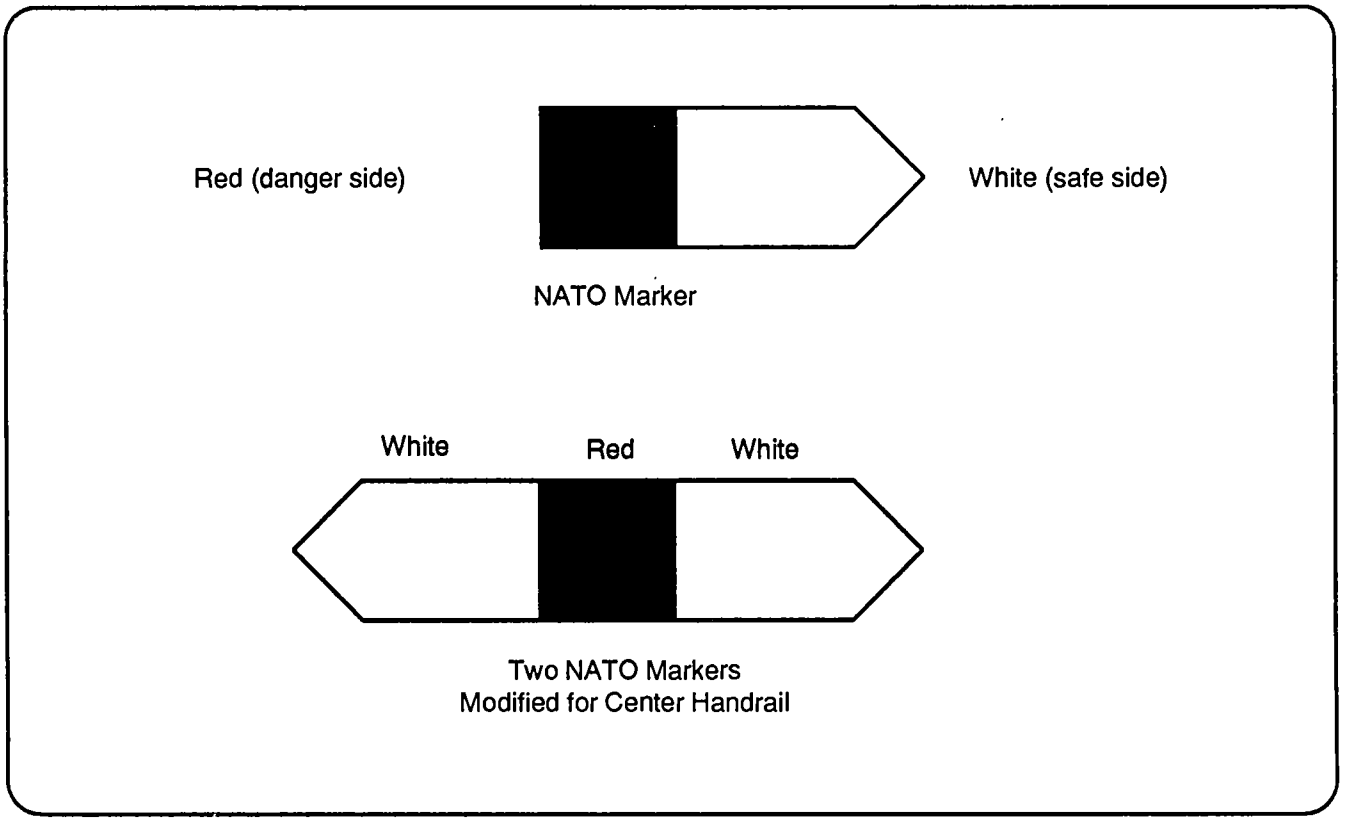


Figure E-7. NATO standard marker.

indicating the lane limit or dangerous side of the lane. Units may fabricate NATO markers if they cannot get them through the supply system. STANAG 2889 requires that markers be large enough to be visible from 50 meters under most daylight conditions and have a field life of 60 days.

Conversion to NATO Standard Marking

To convert intermediate and full lane marking to NATO standard, affix NATO markers to long pickets and replace the existing entrance, exit, funnel, and handrail markers one for one. *Figure E-8* illustrates how the NATO markers are used to convert existing intermediate and full lane-marking patterns. Two NATO markers are used at entrance and exit markings to make them distinctly different. One NATO marker is affixed to each funnel marker and to each left and right handrail marker. When converting a full lane-marking pattern, the center handrail is marked with a modified NATO marker as shown in *Figure E-8*. Since international forces

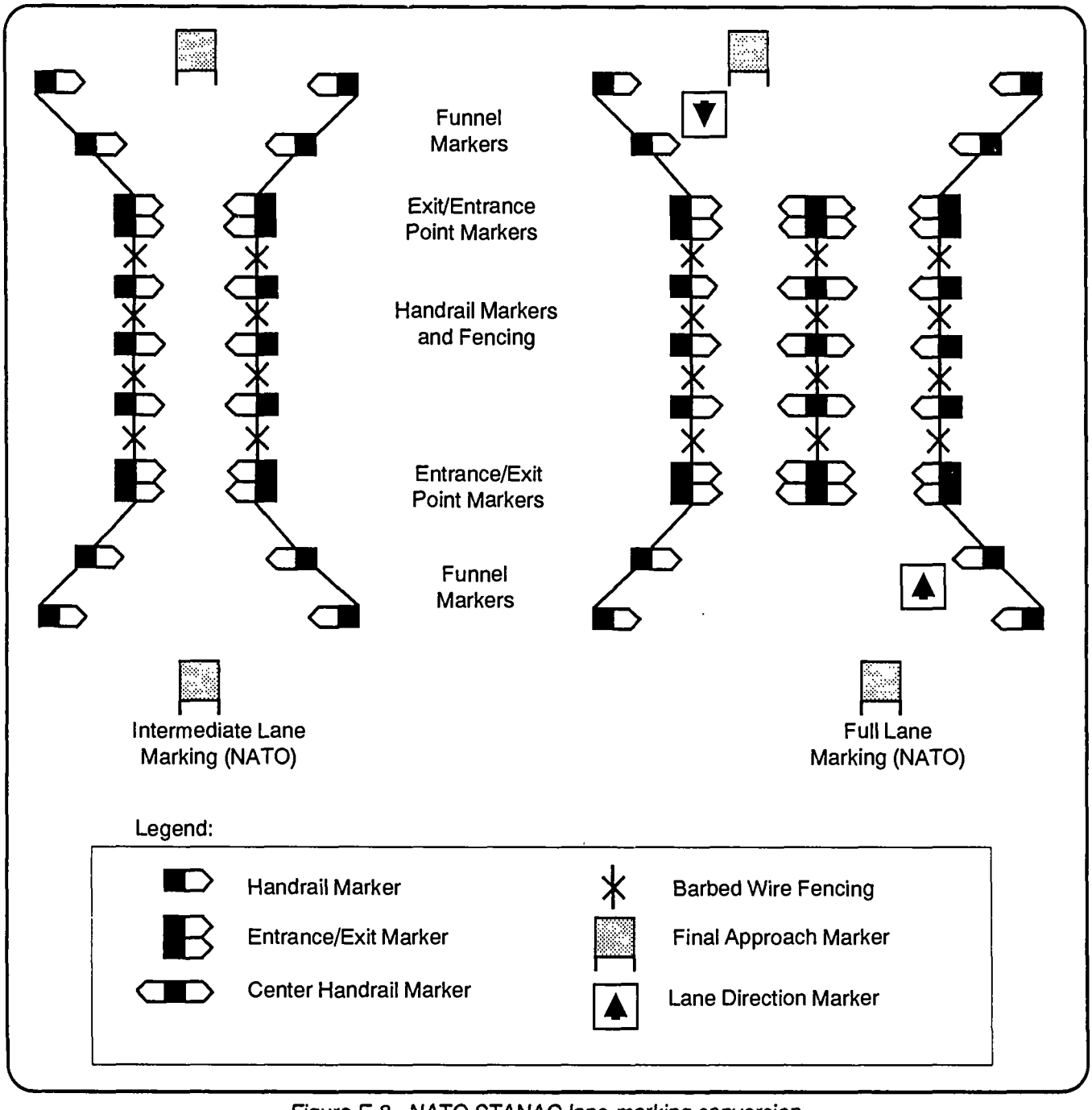


Figure E-8. NATO STANAG lane-marking conversion.

may not be accustomed to using the right lane, directional arrows must be placed to clearly identify lane traffic direction. The combination of modified center handrail marker and directional arrows at each lane entrance provides allied forces the signature necessary to distinguish two separate lanes. In addition, a barbed wire or concertina fence (one strand minimum) is laid 1 meter above the ground to connect funnel, entrance, and handrail markers and exit pickets.

NATO uses white or green lights to illuminate markers at night. Entrance and exit markers are marked with either two green or two white lights placed horizontally so the safe and dangerous markings on them are clearly visible. One white or green light is used on funnel and handrail markers. The commander decides whether the light is placed on top of the NATO marker or placed so that it illuminates the markers (see *Figure E-9*). Lights must be visible from a minimum of 50 meters under most conditions. Light sources for nighttime markers must have a continuous life of 12 hours.

The mission to convert intermediate or full lane-marking patterns to NATO standard is normally assigned to the corps-level engineer battalions working in the division rear area. In special cases, divisional engineer battalions may be tasked

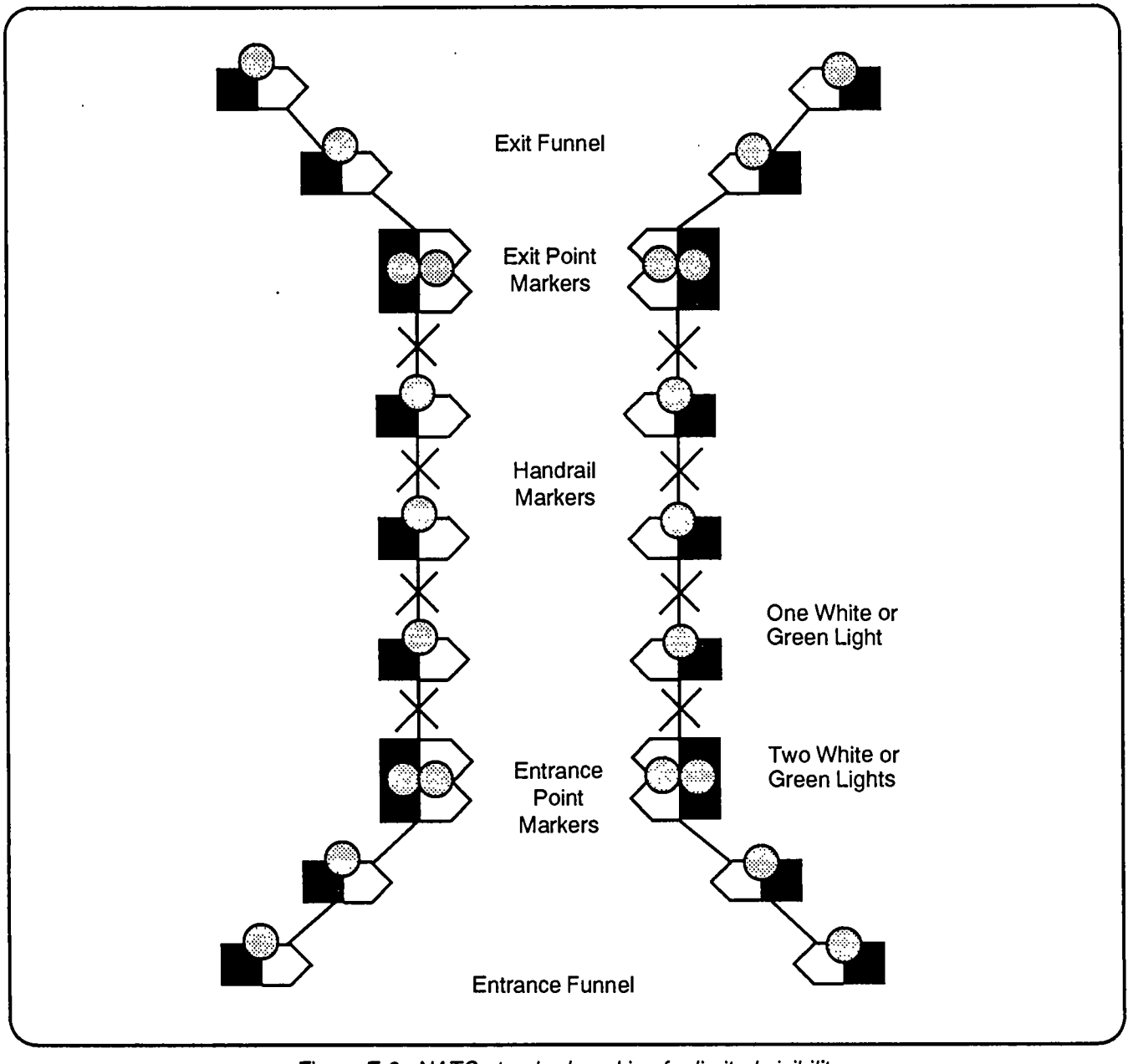


Figure E-9. NATO standard marking for limited visibility.

with NATO marking; this is the exception, not the rule. Therefore, every engineer battalion must maintain a basic load of Minefield Marking Sets #2, as well as the necessary long pickets and barbed wire. Each divisional engineer battalion will maintain eight Minefield Marking Sets #2, giving them the ability to mark 1,600 meters of lane. Engineer battalions at the corps level and above will maintain 16 Minefield Marking Sets #2, giving them the capability to mark 3,200 meters of lane. NATO marking material will be maintained by the headquarters and headquarters company (HHC) of each engineer battalion. It is normally not distributed to companies until it is required by the mission.

Glossary

AA	assembly area
AAR	after-action review
ABF	attack by fire
ACE	armored combat earthmover
AD	armor division
ADA	air defense artillery
ADE	assistant division engineer
ADO	air defense officer
adv	advance
AI	air interdiction
ALO	air liaison officer
AP	antipersonnel
APC	armored personnel carrier
ARPET	Armored Platoon Effectiveness Test
ARTEP	Army Training and Evaluation Program
aslt	assault
AT	antitank
ATGM	antitank guided missile
atk	attack
AVLB	armored vehicle launched bridge
B1	First lane of Movement Corridor Blue
B2	Second lane of Movement Corridor Blue
B3	Third lane of Movement Corridor Blue

BAI	battlefield air interdiction
BAT-2	Soviet tracked engineer dozer
BAT-M	Soviet tracked engineer dozer
BDA	battle damage assessment
bde	brigade
BIFV	Bradley infantry fighting vehicle
BM-21	Soviet 220-millimeter (16-round) multiple rocket launcher
BM-22	Soviet 220-millimeter (16-round) multiple rocket launcher
BMP	Soviet tracked amphibious infantry combat vehicle
bn	battalion
BOS	battlefield operating system
BP	battle position
B/P	be prepared
BTM	Soviet tracked trenching machine
BTM-3	Soviet tracked trenching machine
BTR-50/60	Soviet wheeled amphibious armored personnel carrier
BTU	Soviet tank-mounted dozer blade
C^2	command and control
C^3	command and control communications
C4	composition 4 explosive
CALFEX	combined arms live-fire exercise
CAT	combined arms training
catk	counterattack
CAS	close air support
cbt	combat
cdr	commander

CESO	communications-electronics signal officer
CEV	combat engineer vehicle
chem	chemical
cl	centerline
CLAMS	cleared lane marking system
C/M	countermobility
co	company
COA	course of action
commo	communication
COP	combat outpost
CP	check point
CPX	command post exercise
CRP	combat reconnaissance patrol
CS	combat support
CSM	command sergeant major
CSS	combat service support
CTT	common task test
DA	Department of the Army
decon	decontamination
div	division
DIVARTY	division artillery
DMAIN	division main command post
DP	decision point
DPICM	dual-purpose improved conventional munition
DREAR	division rear command post
DS	direct support

DST	decision support template
DTAC	division tactical command post
DTG	date-time group
EA	engagement area
EBA	engineer battlefield assessment
ech	echelon
ECM	electronic countermeasures
en	enemy
engr	engineer
EOM	end of mission
EW	electronic warfare
FA	field artillery
FAA	forward assembly area
1st	first
FIST	fire support team
FM	field manual; frequency modulation
FSB	forward support battalion
FSE	forward security element
FSO	fire support officer
FSOP	field standing operating procedure
FTX	field training exercise
G1	First lane of Movement Corridor Green
G2	Assistant Chief of Staff, G2 (Intelligence); second lane of Movement Corridor Green
G3	Third lane of Movement Corridor Green

GMZ	Gusenichnyy Mino-Zagraditel' (Soviet armored tracked minelayer)
GPS	Global Positioning System
grd	guard
GSR	ground surveillance radar
HE	high explosive
HEMMS	hand-emplaced minefield-marking set
HEP	high-explosive plastic
HIND-D	Soviet attack helicopter
HIP	Soviet medium-lift helicopter
HHC	headquarters and headquarters company
HVT	high value target
IAW	in accordance with
ICM	improved conventional munition
ID	infantry division
IMR	Soviet armored engineer tractor
IP	improved package
IPB	intelligence preparation of the battlefield
ITV	improved TOW vehicle
JAAT	joint air attack team
KIA	killed in action
LD	line of departure
LOA	limit of advance

LNO	liaison office
lt	light
m	meter(s)
M	contact with obstacle
M1	Abrams main battle tank
M2	Bradley infantry fighting vehicle
M4T6	float bridge
M60	main battle tank
M88	armored recovery vehicle
M113	armored personnel carrier
M203	40-millimeter grenade launcher
M916	medium equipment transport
maint	maintenance
MC	movement corridor
MDK-3	Soviet tracked digging machine
mech	mechanized
med	medium
METL	mission-essential task list
METT-T	mission, enemy, terrain, troops, and time available
mf	minefield
mg	machine gun
MICLIC	mine-clearing line charge
MILES	multiple integrated laser engagement system
min	minute(s)
MLC	military load class
mm	millimeter(s)

MOPP	mission-oriented protection posture
mort	mortar
MOUT	military operations on urbanized terrain
MP	military police
MRB	motorized rifle battalion
MRC	motorized rifle company
MRD	motorized rifle division
MRP	motorized rifle platoon
MRR	motorized rifle regiment
MSR	main supply route
MTP	mission training plan
NAI	named area of interest
NATO	North Atlantic Treaty Organization
NBC	nuclear, biological, chemical
NCO	noncommissioned officer
NET	new equipment training
NLT	not later than
NSN	national stock number
NTC	National Training Center
nuc	nuclear
OB	order of battle
obj	objective
OBSTINTEL	obstacle intelligence
occ	occupy

OCOKA	observation and fire, concealment and cover, obstacles, key terrain, and avenues of approach
O/O	on order
OP	observation post
OPFOR	opposing force
OPLAN	operation plan
OPORD	operation order
OPSEC	operations security
ORP	objective rally point
O/W	overwatch
OZM4	Soviet trip-wire-detonated mine
PCC	precombat checks
PCI	precombat inspection
PMD-GM	Soviet pressure-detonated antipersonnel mine (blast)
PIR	priority intelligence requirement
PL	phase line
PLD	probable line of deployment
plt	platoon
PMN	Soviet pressure-detonated antipersonnel mine (blast)
PMR	Soviet minelaying trailer
POMZ-2M	Soviet trip-wire-detonated mine
POZ	Podvizhnyy Otryad Zagrazhdeniya (Soviet mobile obstacle detachment)
PPMP	Soviet antipersonnel minefield pattern
prep	prepare; preparatory
psn	position
PTMP	Soviet antitank minefield pattern

PZM	Soviet wheeled trench-digging machine
PZM-2	Soviet wheeled trench-digging machine
R1	First lane of Movement Corridor Red
R2	Second lane of Movement Corridor Red
R3	Third lane of Movement Corridor Red
RAG	regimental artillery group (OPFOR)
recon	reconnaissance
RII	request for intelligence information
RP	release point
R&S	reconnaissance and surveillance
S1	Adjutant Officer (US Army)
S2	Intelligence Officer (US Army)
S3	Operations and Training Officer (US Army)
S4	Supply Officer (US Army)
S4S	surfaced 4 sides
SAFAD	small arms for air defense
sec	section
2d	second
SM	scatterable mines
SOP	standing operating procedure
SOSR	suppress, obscure, secure, reduce
SP	start point
spt	support
sqd	squad
SQT	skill qualification test

ST	student text
STANAG	Standardization Agreement
STX	situational training exercise
T54	Soviet main battle tank
T55	Soviet main battle tank
T62	Soviet main battle tank
T72	Soviet main battle tank
TAA	tactical assembly area
TAB	target acquisition batteries
TAC	tactical command post
TACON	tactical control
TAI	target area of interest
TC	tank commander
TCP	traffic control post
T/C/S	tasks/conditions/standards
TD	tank division
T&EO	training and evaluation outline
TEWT	tactical exercise without troops
TF	task force
3d	third
thru	through
tm	team
TM	technical manual
TNT	trinitrotoluene
TOW	tube-launched, optically-tracked, wire-guided (antitank missile)
TR	tank regiment

trn	train
TRP	target reference point
TTP	tactics, techniques, and procedures
US	United States
WIA	wounded in action
WWII	World War II
XO	executive officer

Engineer Equipment Symbols

Antibunker,

Light

Medium

Heavy

APC Towing MICLIC

Armored Combat Earthmover

Armored Vehicle-mounted MICLIC

Combat Engineer Vehicle

Combat Mobility Vehicle

Heavy Assault Bridge

Heavy Tank w/Plow

Heavy Tank w/Roller

Trailer-mounted MICLIC

Engineer Units Symbols

Air Assault

Airborne

Engineer

Light

Mechanized (Corps)

Mechanized (Divisional)

Motorized

References

SOURCES USED

These are the sources quoted or paraphrased in this publication.

International Standardization Agreements (STANAGs)

STANAG 2889. *Marking of Hazardous Areas and Routes Through Them (3rd Edition).* 8 February 1990.

Joint and Multiservice Publications

JPRS-UMA-85-020-1. *USSR Report, Military Affairs, Combat Engineer Support.* 26 August 1985. **(Caution: This reference is provided, though not officially approved, as the only unclassified source of this information).**

Army Publications

ARTEP 5-145-11-MTP. *Mission Training Plan for the Combat Engineer Platoon, Heavy Division/Corps/Armored Cavalry* Regiment. 17 February 1989.
ARTEP 5-145-31-MTP. *Mission Training Plan for the Engineer Company, Heavy Division/Corps/Armored Cavalry Regiment.* 17 February 1989.
ARTEP 7-8-MTP. *Mission Training Plan for the Infantry Rifle Platoon and Squad.* 30 September 1988.
ARTEP 17-237-10-MTP. *Mission Training Plan for the Tank Platoon.* 3 October 1988.
ARTEP 71-1-MTP. *Mission Training Plan for Tank and Mechanized Infantry Company Team.* 3 October 1988.
ARTEP 71-2-MTP. *Mission Training Plan for the Tank and Mechanized Infantry Battalion Task Force.* 3 October 1988.
FM 5-100. *Engineer Combat Operations.* 22 November 1988.
FM 5-101. *Mobility.* 23 January 1985.
FM 20-32. *Mine/Countermine Operations.* 9 December 1985.
FM 25-100. *Training the Force.* 15 November 1988.
FM 25-101. *Battle Focused Training.* 30 September 1990.
FM 34-1. *Intelligence and Electronic Warfare Operations.* 2 July 1987.
FM 71-1. *The Tank and Mechanized Infantry Company Team.* 22 November 1988.
FM 71-2. *The Tank and Mechanized Infantry Battalion Task Force.* 27 September 1988.
FM 71-3. *Armored and Mechanized Infantry Brigade.* 11 May 88.
FM 90-13. *River Crossing Operations.* To be published in the next six months.
FM 100-5. *Operations.* 5 May 1986.
FM 101-5-1. *Operational Terms and Symbols.* 21 October 1985.
ST 100-9. *The Command Estimate.* July 1989.

DOCUMENTS NEEDED

These documents must be available to the intended users of this publication.

DA Form 2028. *Recommended Changes to Publications and Blank Forms.* Feb 74.
FM 71-100. *Division Operations.* 16 June 1990.
FM 71-100-1. *Armor and Mechanized Division Operations: Tactics and Techniques.* To be published in the next six months.

READINGS RECOMMENDED

These readings contain relevant supplemental information.

JPRS-UMA-85-020-1. *USSR Report, Military Affairs, Combat Engineer Support.* 26 August 1985. **(Caution: This reference is provided, though not officially approved, as the only unclassified source of this information).**
ST 100-9. *The Command Estimate.* July 1989.

Index

Armor Platoon Effectiveness Test (ARPET), 1-4

assault,
  breach, 2-8, 5-1 through 5-5
    company team level actions, 5-3
    command and control, 5-2
    commander's decision to, 5-1
    consolidation, 5-3
    executing, 5-3, 5-4
    fundamentals, 5-1
    heavy company team, 5-3
    lane requirements, 5-2
    light-heavy task force, 5-3
    maintaining momentum, 5-1
    nature of, 5-1
    obscure, 5-2
    planning, 5-1
    preparing, 5-4
    reduce, 5-2
    secure, 5-2
    suppress, 5-2
    training, 7-4
  force
    achieving mass, 2-4
    allocation, 2-4
    in a deliberate breach, 4-3, 4-5, 4-9

breach,
  assessing proficiency, 7-1
  complexity, 2-6
  force, 2-3
    assault, 5-2
    covert, 6-2
    deliberate, 4-3 through 4-9
    in-stride, 3-2
  organization, 2-3
    assault, 6-1
    covert, 6-2
    deliberate breach, 4-1
    in-stride, 3-1
  training, 7-1 through 7-12
    assault, 7-4
    assessing proficiency, 7-1
    breach operations outline, 7-1
    covert, 7-4
    critical collective tasks, 7-5
    cycle, 7-1, 7-2
    CALFEX, 7-10
    leader training, 7-4
    situational training exercise (STXs), 7-4, 7-10
    tactical exercises without troops (TEWTs), 7-4, 7-10
  exercises, 7-4
  Green, Amber, Red, 7-1
  in-stride, 7-4
  mission training plans, 7-1
  offensive operations outline, 7-2, 7-3
  task conditions and standards, 7-4
  unplanned, 2-10

breaching,
  brigade,
    covert, 6-2
    deliberate, 4-5, 4-11
    in-stride, 3-1
  fundamentals, 2-2
    assault, 5-1
    covert, 6-1
    deliberate, 4-1, 4-3, 4-4
    in-stride breach, 3-1
  techniques. *See* obstacle reduction techniques.
  tenets, 2-1

"bull through", 1-4, 2-1

bypass, 2-1

clearing operations, 2-1

combined arms live-fire exercise (CALFEX), 7-10

command and control, 2-8
  assault, 5-2
  covert, 6-2
  deliberate, 4-3, 4-6
  in-stride, 3-1

commander's breach decisions,
  assault, 5-1
  covert, 6-1
  deliberate, 4-1
  in-stride, 3-1

command estimate, 4-6

complex obstacles, 4-3, 4-5, 4-11

control measures,
  fire, 2-3, 2-4
  maneuver, 2-8

covert breach, 2-10, 6-1 through 6-5
  brigade, 6-2
  commander's decision to, 6-1
  force allocation, 6-2
  obscure, 6-2
  planning, 6-2
  reconnaissance, 6-3
  reduce, 6-2
  rehearsals, 6-3
  secure, 6-2
  supporting a dismounted attack, 6-1
  supporting a mounted attack, 6-1
  suppress, 6-1
  transition to an assault, 6-2

critical collective breach tasks, 7-5

defense, Soviet, 1-3

deliberate breach, 2-8, 4-1 through 4-16
  assault force, 4-3, 4-5
  breach force, 4-3 through 4-6
  brigade, 4-1, 4-4
  command and control, 4-3
  commander's decision to, 4-1
  complex obstacle, 4-3, 4-5, 4-11
  executing, 4-6
  force allocation, 4-1
  intelligence collection, 4-5
  obscure, 4-3, 4-7
  planning, 4-4
  preparing, 4-5
  reduce, 4-4
  rehearsal, 4-5
  secure, 4-3
  support force, 4-1
  suppress, 4-1, 4-5, 4-6
  task force, 4-4, 4-11
    rehearsals, D-11
      initial, D-11
      final, D-11
      subordinate, D-11
  task organization, 4-5
  training, 7-2, 7-1
  transition from the in-stride, 3-4

enemy obstacles. *See* Soviet obstacles.

engineer battlefield assessment (EBA), 3-2

engineer integration into the force, 2-5
  assault, 5-2
  covert, 6-2, 6-3
  deliberate, 4-4, 4-6
  in-stride, 3-4

execution,
  assault, 5-3, 5-4
  covert, 6-5
  deliberate, 4-6
  in-stride, 3-4
  matrix, 2-8, 2-9
    lead team of task force deliberate, 3-9
    task force deliberate, 4-16
    task force in-stride, 3-4

force allocation, 2-3
  assault, 2-4
  breach,
    covert, 6-2
    deliberate, 4-5
  mobility, 3-9, 4-4

formations, engineer integration into,
  company team echelon, 3-6, 3-7
  task force box, 3-5
  task force column, 3-4
  task force echelon right, 3-5
  task force V, 3-5
  task force wedge, 3-5

Gusenichyy Mino-Zagraditel' (GMZ), A-1

indirect fires, 4-1

in-stride breach, 2-8, 3-1 through 3-11
  commander's decision to, 3-1
  executing, 3-4
  integration of engineers, 3-4
  intelligence collection, 3-3
  mobility reserve, 3-3
  movement to contact, 3-3, 3-4
  obscure, 3-2
  planning, 3-2
  preparing, 3-3
  reduce, 3-2
  rehearsals, 3-3
  secure, 3-2
  suppress, 3-1
  task force, D-15
    rehearsals, D-15

initial, D-15
final, D-15
subordinate, D-15
task organization, 3-3
training, 7-4
transition to a deliberate, 3-4

intelligence,
analyzing, B-1, B-2
collection, B-1, B-2
decision support template (DST), B-1
deliberate, 4-5
in-stride, 3-3
named areas of interest (NAIs), B-1
obstacles, 2-1, 2-2
planning, B-1
PIR, 1-2, 2-1
preparation of battlefield, 2-1, B-1
reconnaissance and surveillance (R&S), 2-1, B-1, B-2
reconnaissance scenario, B-2
scouts and engineer reconnaissance, 2-2, B-2
significance of obstacle activities, A-8
targeted areas of interest (TAIs), B-1
templating obstacles, 4-5, B-1

lane,
marking, C-15
devices, E-11
levels, E-2 through E-6
requirements, 2-3, 2-10
assault breach, 5-2
covert breach, 6-2
terms, E-1
guides and traffic control posts, E-2
markers, E-1
entrance, E-1
entrance tunnel, E-2
exit, E-2
far recognition, E-2
final approach, E-2
handrail, E-1

limited visibility, 6-1

maneuver, 2-8
challenge to, 1-1

mass, 2-4

mine-clearing line charge (MICLIC), C-1, C-2, C-4

minefields,
enemy. *See* Soviet obstacles.
enemy emplacing systems. *See* Soviet obstacles.

mission training plans (MTP), 7-1

mobility,
force allocation, 3-9, 4-4
reserve, 3-3

movement to contact, 3-3, 3-4

obscure, 2-3
assault breach, 5-2
covert breach, 6-2
deliberate breach, 4-3, 4-7
in-stride breach, 3-2

obstacle,
intelligence. *See* intelligence.
reduction techniques, C-1 through C-17
armored personnel carrier (APC) grapnel, C-11
armored vehicle launched bridge (AVLB), C-10
assault ladder, C-13
bangalore torpedoes, C-13
blades, C-9
combat engineer vehicle (CEV), C-2, C-3, C-5, C-7, C-9, C-10, C-11
covert, C-13
direct fire, C-5
fascines, C-10
lane marking, C-15
M9 armored combat earthmover (ACE), C-9
manual reduction, buried mines, C-12
manual reduction, surface-laid mines, C-11
MICLIC, C-1, C-2, C-4
mine detectors, C-12
mine plow, C-5
mine roller, C-8
multiple reduction techniques, C-16
templating. *See* intelligence.

obstacles, enemy. *See* Soviet obstacles.

planning,
assault breach, 5-1
breach training, 7-1
covert breach, 6-2
deliberate breach, 4-4
in-stride breach, 3-2

Podvizhnyy Otryad Zagrazhdeniya (POZ), 1-1, A-1, A-2

preparing,
assault breach, 5-4

covert breach, 6-3
deliberate breach, 4-5
in-stride breach, 3-2

priority intelligence requirement (PIR). *See* intelligence.

protective obstacles. *See* Soviet obstacles.

reconnaissance, 2-1, 2-2
analyzing, B-2
planning, B-1. *See* also intelligence.
scouts and engineers, 2-2

reduce, 2-3. *See* also obstacle reduction.
assault breach, 5-2
covert breach, 6-2
deliberate breach, 4-4
in-stride breach, 3-2
techniques, C-1 through C-17

rehearsals, 2-7
assault, 5-4
covert, 6-3
deliberate, 4-5
in-stride, 3-3
techniques, D-1
back brief, D-1
full-scale, D-2
rock drill, D-1
walk through, D-2

scenarios,
assault breach, 5-3
covert breach, 6-3
deliberate breach, 4-11
in-stride breach, 3-6
reconnaissance, B-2

secure, 2-3
assault breach, 5-2
covert breach, 6-2
deliberate breach, 4-3
in-stride breach, 3-2

situation template, B-1, B-2
confirming, B-1
developing, B-1
refining, B-2
using in planning, B-2

Soviet obstacles, A-1 through A-8
digging capability, A-7
employment concepts, A-2
meeting engagement, 1-2
minefield parameters, A-3
minefields, A-2, A-4, A-5
minelaying capability, 1-2, A-1, A-2
POZ, 1-1, A-1, A-2
protective obstacles, 1-1, A-2
significant obstacle activities A-8
strongpoint, 1-2
tactical obstacles, 1-1, A-4, A-5

suppress, 2-2
assault breach, 5-2
covert breach, 6-1
deliberate breach, 4-1
in-stride breach, 3-1

synchronization, 2-5
assault, 5-1
command and control, 2-8
control measures,
fire, 2-3, 2-4
maneuver, 2-8
covert, 6-3
deliberate, 4-4, 4-6
in-stride, 3-4
leaders' role, 2-8
rehearsals, 2-8

task organization, 2-3
assault, 5-1
covert, 6-1, 6-2
deliberate, 4-5
in-stride, 3-3

training, 7-1 through 7-12. *See* also breach training

*U.S. Government Printing Office: 1993 — 728-027/60120

FM 90-13-1
28 FEBRUARY 1991

By Order of the Secretary of the Army:

CARL E. VUONO
General, United States Army
Chief of Staff

Official:

JOHN A. FULMER
Colonel, United States Army
Acting The Adjutant General

DISTRIBUTION:

Active Army, USAR, and ARNG: To be distributed in accordance with DA Form 12-11E, requirements for FM 90-13-1, Combined Arms Breaching Operations (Qty rqr block no. 5012).

☆ U.S. GOVERNMENT PRINTING OFFICE: 1991 — 527-027/20126

S/S by Change 1, dtd 7 Mar 1993

APPENDIX A. SOVIET OBSTACLE WARFARE A-1

APPENDIX B. INTELLIGENCE PREPARATION OF THE BATTLEFIELD B-1

APPENDIX C. OBSTACLE REDUCTION TECHNIQUES C-1

GLOSSARY Glossary-1

REFERENCES References-1

INDEX Index-1

Preface

SCOPE

This manual outlines the Department of the Army (DA) doctrine for combined arms breaching operations. Fighting as a combined arms team is imperative to breaching success and is the centerpiece of the manual. The manual begins with a discussion of the breaching challenges facing the commander on a modern battlefield where maintaining freedom to maneuver is mission-essential. The theory behind breaching operations is then outlined to equip the commander with the fundamentals needed to integrate a breach into his tactical planning, preparation, and execution. Subsequent chapters discuss in detail the various types of breaching operations available to the commander: in-stride, deliberate, assault, and covert. The focus of these chapters is what drives the commander to decide what type of breach to plan and prepare for and to execute based on mission, enemy, terrain, troops, and time available (METT-T). Breach training is vital to our Army's preparedness for combat. Therefore, an entire chapter is devoted to integrating breach training into unit training plans. Lastly, this manual provides supplemental information on Soviet obstacle warfare, intelligence preparation of the battlefield (IPB), and obstacle reduction techniques.

PURPOSE

This manual provides combined arms commanders from company to brigade and their staffs with the doctrine, tactics, and techniques needed to successfully overcome obstacles. It provides the commander with breaching fundamentals and information for planning, preparing, and executing the in-stride, deliberate, assault, and covert breach. This manual also gives the coordinating and special staff officer a basis for synchronizing all combat multipliers during a breach.

This manual also serves as a source of information for non-DA planners who may be involved in operating with ground forces conducting offensive operations.

USER INFORMATION

The proponent of this publication is HQ TRADOC. Send comments and recommendations on DA Form 2028 (Recommended Changes to Publications and Blank Forms) directly to Commandant, US Army Engineer School, ATTN: ATSE-TDM-P, Fort Leonard Wood, MO 65473-6650.

Unless this publication states otherwise, masculine nouns and pronouns do not refer exclusively to men.

Glossary

ABF	attack by fire
ACE	armored combat earthmover
AD	armor division
ADA	air defense artillery
ADO	air defense officer
adv	advance
AP	antipersonnel
APC	armored personnel carrier
ARPET	Armored Platoon Effectiveness Test
ARTEP	Army Training and Evaluation Program
aslt	assault
AT	antitank
ATGM	antitank guided missile
atk	attack
AVLB	armored vehicle launched bridge
BAT-2	Soviet tracked engineer dozer
BAT-M	Soviet tracked engineer dozer
bde	brigade
BIFV	Bradley infantry fighting vehicle
BM-22	Soviet 220-millimeter (16-round) multiple rocket launcher
BMP	Soviet tracked amphibious infantry combat vehicle
bn	battalion
BP	battle position

B/P	be prepared
BTM	Soviet tracked trenching machine
BTM-3	Soviet tracked trenching machine
BTR-50/60	Soviet wheeled amphibious armored personnel carrier
BTU	Soviet tank-mounted dozer blade
C4	composition 4 explosive
CALFEX	combined arms live-fire exercise
catk	counterattack
CAS	close air support
cbt	combat
cdr	commander
CEV	combat engineer vehicle
chem	chemical
cl	centerline
CLAMS	cleared lane marking system
C/M	countermobility
co	company
COA	course of action
commo	communication
COP	combat outpost
CP	check point
CPX	command post exercise
CRP	combat reconnaissance patrol
CTT	common task test
DA	Department of the Army

decon	decontamination
div	division
DP	decision point
DPICM	dual-purpose improved conventional munition
DS	direct support
DST	decision support template
DTG	date-time group
EA	engagement area
EBA	engineer battlefield accessment
ECM	electronic countermeasures
en	enemy
engr	engineer
EOM	end of mission
FA	field artillery
FIST	fire support team
FM	field manual
FSE	forward security element
FSO	fire support officer
FSOP	field standing operating procedure
FTX	field training exercise
GMZ	Gusenichnyy Mino-Zagraditel' (Soviet armored tracked minelayer)
grd	guard
GSR	ground surveillance radar
HE	high explosive

HEMMS	hand-emplaced minefield-marking set
HEP	high-explosive plastic
HIND-D	Soviet attack helicopter
HIP	Soviet medium-lift helicopter
IAW	in accordance with
ICM	improved conventional munition
ID	infantry division
IMR	Soviet armored engineer tractor
IP	improved package
IPB	intelligence preparation of the battlefield
ITV	improved TOW vehicle
KIA	killed in action
LD	line of departure
lt	light
m	meter
M	contact with obstacle
M1	Abrams main battle tank
M2	Bradley infantry fighting vehicle
M4T6	float bridge
M60	main battle tank
M88	armored recovery vehicle
M113	armored personnel carrier
M203	40-millimeter grenade launcher

M916	medium equipment transport
maint	maintenance
MDK-3	Soviet tracked digging machine
mech	mechanized
med	medium
METL	mission-essential task list
METT-T	mission, enemy, terrain, troops, and time available
mf	minefield
mg	machinegun
MICLIC	mine-clearing line charge
MILES	multiple integrated laser engagement system
min	minute
MLC	military load class
mm	millimeter
MOPP	mission-oriented protection posture
mort	mortar
MOUT	military operations on urbanized terrain
MRB	motorized rifle battalion
MRC	motorized rifle company
MRD	motorized rifle division
MRP	motorized rifle platoon
MRR	motorized rifle regiment
MTP	mission training plan
NAI	named area of interest
NBC	nuclear, biological, chemical
NCO	noncommissioned officer

NET	new equipment training
NLT	not later than
NTC	National Training Center
nuc	nuclear
OB	order of battle
obj	objective
OBSTINTEL	obstacle intelligence
occ	occupy
OCOKA	observation and fire, concealment and cover, obstacles, key terrain, and avenues of approach
O/O	on order
OP	observation post
OPFOR	opposing force
OPORD	operation order
ORP	objective rally point
O/W	overwatch
OZM4	Soviet trip-wire-detonated mine
PCI	precombat inspection
PMD-GM	Soviet pressure-detonated antipersonnel mine (blast)
PIR	priority intelligence requirement
PL	phase line
PLD	probable line of deployment
plt	platoon
PMN	Soviet pressure-detonated antipersonnel mine (blast)
PMR	Soviet minelaying trailer

POMZ-2M	Soviet trip-wire-detonated mine
POZ	Podvizhnyy Otryad Zagrazhdeniya (Soviet mobile obstacle detachment)
PPMP	Soviet antipersonnel minefield pattern
prep	prepare
psn	position
PTMP	Soviet antitank minefield pattern
PZM	Soviet wheeled trench-digging machine
PZM-2	Soviet wheeled trench-digging machine
RAG	regimental artillery group (OPFOR)
recon	reconnaissance
RII	request for intelligence information
R&S	reconnaissance and surveillance
S2	intelligence officer (US Army)
S3	operations and training officer (US Army)
S4	supply officer (US Army)
S4S	surfaced 4 sides
sec	section
SM	scatterable mines
SOP	standing operating procedure
SOSR	suppress, obscure, secure, reduce
spt	support
sqd	squad
SQT	skill qualification test
STX	situational training exercise

T54	Soviet main battle tank
T55	Soviet main battle tank
T62	Soviet main battle tank
T72	Soviet main battle tank
TAI	target area of interest
TD	tank division
T&EO	training and evaluation outline
TEWT	tactical exercise without troops
TF	task force
thru	through
tm	team
TM	technical manual
TNT	trinitrotoluene
TOW	tube-launched, optically-tracked, wire-guided (antitank missile)
TR	tank regiment
tm	train
TRP	target reference point
US	United States
WIA	wounded in action
WWII	World War II
XO	executive officer

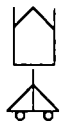
Engineer Equipment Symbols

Antibunker,

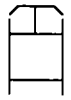
Light

Medium

Heavy

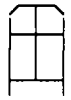


APC Towing MICLIC

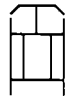


Armored Combat Earthmover

Armored Vehicle-Mounted MICLIC



Combat Engineer Vehicle



Combat Mobility Vehicle

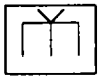
Heavy Assault Bridge

Heavy Tank with Plow

Heavy Tank with Roller

Trailer-Mounted MICLIC

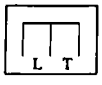
Engineer Unit Symbols



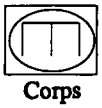
Air Assault

Airborne

Engineer

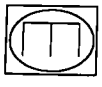


Light

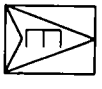


Corps

Mechanized (Corps)



Mechanized (Divisional)



Motorized

References

SOURCES USED

These are the sources quoted or paraphrased in this publication.

Joint and Multiservice Publications

JPRS-UMA-85-020-1. *USSR Report, Military Affairs, Combat Engineer Support.* 26 August 1985. **(Caution: This reference is provided, though not officially approved, as the only unclassified source of this information).**

Army Publications

ARTEP 5-145-11-MTP. *Mission Training Plan for the Combat Engineer Platoon, Heavy Division/Corps/Armored Cavalry* Regiment. 17 February 1989.
ARTEP 5-145-31-MTP. *Mission Training Plan for the Engineer Company, Heavy Division/Corps/Armored Cavalry Regiment.* 17 February 1989.
ARTEP 7-8-MTP. *Mission Training Plan for the Infantry Rifle Platoon and Squad.* 30 September 1988.
ARTEP 17-237-10-MTP. *Mission Training Plan for the Tank Platoon.* 3 October 1988.
ARTEP 71-1-MTP. *Mission Training Plan for Tank and Mechanized Infantry Company Team.* 3 October 1988.
ARTEP 71-2-MTP. *Mission Training Plan for the Tank and Mechanized Infantry Battalion Task Force.* 3 October 1988.
FM 5-100. *Engineer Combat Operations.* 22 November 1988.
FM 5-101. *Mobility.* 23 January 1985.
FM 20-32. *Mine/Countermine Operations.* 9 December 1985.
FM 25-100. *Training the Force.* 15 November 1988.
FM 34-1. *Intelligence and Electronic Warfare Operations.* 2 July 1987.
FM 71-1. *The Tank and Mechanized Infantry Company Team.* 22 November 1988.
FM 71-2. *The Tank and Mechanized Infantry Battalion Task Force.* 27 September 1988.
FM 71-3. *Armored and Mechanized Infantry Brigade.* 11 May 88.
FM 90-13. *River Crossing Operations.* To be published in the next six months.
FM 100-5. *Operations.* 5 May 1986.
FM 101-5-1. *Operational Terms and Symbols.* 21 October 1985.
ST 100-9. *The Command Estimate.* July 1989.

DOCUMENTS NEEDED

These documents must be available to the intended users of this publication.

DA Form 2028. *Recommended Changes to Publications and Blank Forms.* Feb 74.

READINGS RECOMMENDED

These readings contain relevant supplemental information.

JPRS-UMA-85-020-1. *USSR Report, Military Affairs, Combat Engineer Support.* 26 August 1985. **(Caution: This reference is provided, though not officially approved, as the only unclassified source of this information).**
ST 100-9. *The Command Estimate.* July 1989.

Index

Armor Platoon Effectiveness Test (ARPET), 1-4

assault,
  breach, 2-8, 5-1 through 5-5
    fundamentals, 5-1
    company team level actions, 5-3
    command and control, 5-2
    commander's decision to, 5-1
    consolidation, 5-3
    executing, 5-3, 5-4
    heavy company team, 5-3
    lane requirements, 5-2
    light-heavy task force, 5-3
    maintaining momentum, 5-1
    nature of, 5-1
    obscure, 5-2
    planning, 5-1
    preparing, 5-4
    reduce, 5-2
    secure, 5-2
    suppress, 5-2
    training, 7-4
  force
    achieving mass, 2-4
    allocation, 2-4
    in a deliberate breach, 4-3, 4-5, 4-9

breach,
  assessing proficiency, 7-1
  complexity, 2-6
  force, 2-3
    assault, 5-2
    covert, 6-2
    deliberate, 4-3 through 4-9
    in-stride, 3-2
  organization, 2-3
    assault, 6-1
    covert, 6-2
    deliberate breach, 4-1
    in-stride, 3-1
  training, 7-1 through 7-12
    assault, 7-4
    assessing proficiency, 7-1
    breach operations outline, 7-1
    covert, 7-4
    critical collective tasks, 7-5
    Green, Amber, Red, 7-1
    in-stride, 7-4
    mission training plans, 7-1
    offensive operations outline, 7-2, 7-3
    task conditions and standards, 7-4
    exercises, 7-4
    cycle, 7-1, 7-2
      tactical exercises without troops (TEWTs), 7-4, 7-10
      situational training exercise (STXs), 7-4, 7-10
      leader training, 7-4
      CALFEX, 7-10
  unplanned, 2-10

breaching,
  techniques. *See* obstacle reduction techniques.
  tenets, 2-1
  fundamentals, 2-2
    assault, 5-1
    covert, 6-1
    deliberate, 4-1, 4-3, 4-4
    in-stride breach, 3-1
  brigade,
    covert, 6-2
    deliberate, 4-5, 4-11
    in-stride, 3-1

"bull through", 1-4, 2-1

bypass, 2-1

combined arms live-fire exercise (CALFEX), 7-10

clearing operations, 2-1

command and control, 2-8
  assault, 5-2
  covert, 6-2
  deliberate, 4-3, 4-6
  in-stride, 3-1

command estimate, 4-6
commander's breach decisions,
  assault, 5-1
  covert, 6-1
  deliberate, 4-1
  in-stride, 3-1
complex obstacles, 4-3, 4-5, 4-11

control measures,
fire, 2-3, 2-4
maneuver, 2-8
covert breach, 2-10, 6-1 through 6-5
brigade, 6-2
commander's decision to, 6-1
force allocation, 6-2
obscure, 6-2
planning, 6-2
reconnaissance, 6-3
reduce, 6-2
rehearsals, 6-3
secure, 6-2
supporting a dismounted attack, 6-1
supporting a mounted attack, 6-1
suppress, 6-1
transition to an assault, 6-2

critical collective breach tasks, 7-5

defense, Soviet, 1-3

deliberate breach, 2-8, 4-1 through 4-16
assault force, 4-3, 4-5
breach force, 4-3 through 4-6
brigade, 4-1, 4-4
command and control, 4-3
commander's decision to, 4-1
complex obstacle, 4-3, 4-5, 4-11
executing, 4-6
force allocation, 4-1
intelligence collection, 4-5
obscure, 4-3, 4-7
planning, 4-4
preparing, 4-5
reduce, 4-4
rehearsal, 4-5
secure, 4-3
support force, 4-1
suppress, 4-1, 4-5, 4-6
task organization, 4-5
task force, 4-4, 4-11
training, 7-2, 7-1
transition from the in-stride, 3-4

enemy obstacles. *See* Soviet obstacles.

engineer battlefield assessment (EBA), 3-2

engineer integration into the force, 2-5
assault, 5-2
covert, 6-2, 6-3
deliberate, 4-4, 4-6
in-stride, 3-4

execution,
assault, 5-3, 5-4
covert, 6-5
deliberate, 4-6
in-stride, 3-4
matrix, 2-8, 2-9
lead team of task force deliberate, 3-9
task force deliberate, 4-16
task force in-stride, 3-4

force allocation, 2-3
assault, 2-4
breach,
covert, 6-2
deliberate, 4-5
mobility, 3-9, 4-4

formations, engineer integration into,
company team echelon, 3-6, 3-7
task force echelon right, 3-5
task force box, 3-5
task force V, 3-5
task force wedge, 3-5
task force column, 3-4

Gusenichyy Mino-Zagraditel' (GMZ), A-1

indirect fires, 4-1

in-stride breach, 2-8, 3-1 through 3-11
commander's decision to, 3-1
executing, 3-4
integration of engineers, 3-4
intelligence collection, 3-3
mobility reserve, 3-3
movement to contact, 3-3, 3-4
obscure, 3-2
planning, 3-2
preparing, 3-3
reduce, 3-2
rehearsals, 3-3
secure, 3-2
suppress, 3-1
task organization, 3-3
training, 7-4
transition to a deliberate, 3-4

intelligence,
analyzing, B-1, B-2
collection, B-1, B-2
decision support template (DST), B-1

deliberate, 4-5
in-stride, 3-3
named areas of interest (NAIs), B-1
obstacles, 2-1, 2-2
planning, B-1
preparation of battlefield, 2-1, B-1
PIR, 1-2, 2-1
reconnaissance scenario, B-2
reconnaissance and surveillance (R&S), 2-1, B-1, B-2
scouts and engineer reconnaissance, 2-2, B-2
significance of obstacle activities, A-8
targeted areas of interest (TAIs), B-1
templating obstacles, 4-5, B-1

lane,
marking, C-15
requirements, 2-3, 2-10
assault breach, 5-2
covert breach, 6-2

limited visibility, 6-1

maneuver, 2-8
challenge to, 1-1

mass, 2-4

mine-clearing line charge (MICLIC), C-1, C-2, C-4

minefields,
enemy. *See* Soviet obstacles.
enemy emplacing systems. *See* Soviet obstacles.

mission training plans (MTP), 7-1

mobility,
force allocation, 3-9, 4-4
reserve, 3-3

movement to contact, 3-3, 3-4

obscure, 2-3
assault breach, 5-2
covert breach, 6-2
deliberate breach, 4-3, 4-7
in-stride breach, 3-2

obstacles, enemy. *See* Soviet obstacles.

obstacle,
intelligence. *See* intelligence.
reduction techniques, C-1 through C-17
armored personnel carrier (APC) grapnel, C-11
assault ladder, C-13
armored vehicle launched bridge (AVLB), C-10
bangalore torpedoes, C-13
blades, C-9
combat engineer vehicle (CEV), C-2, C-3, C-5, C-7, C-9, C-10, C-11
covert, C-13
direct fire, C-5
fascines, C-10
lane marking, C-15
M9 armored combat earthmover (ACE), C-9
manual reduction, surface-laid mines, C-11
manual reduction, buried mines, C-12
MICLIC, C-1, C-2, C-4
mine detectors, C-12
mine plow, C-5
mine roller, C-8
multiple reduction techniques, C-16
templating. *See* intelligence.

planning,
assault breach, 5-1
breach training, 7-1
covert breach, 6-2
deliberate breach, 4-4
in-stride breach, 3-2
sequence, 2-10

Podvizhnyy Otryad Zagrazhdeniya (POZ), 1-1, A-1, A-2

preparing,
assault breach, 5-4
covert breach, 6-3
deliberate breach, 4-5
in-stride breach, 3-2

priority intelligence requirement (PIR). *See* intelligence.

protective obstacles. *See* Soviet obstacles.

reconnaissance, 2-1, 2-2
analyzing, B-2
planning, B-1. *See* also intelligence.
scouts and engineers, 2-2

reduce, 2-3. *See* also obstacle reduction.
assault, 5-2
covert, 6-2
deliberate, 4-4
in-stride, 3-2
techniques, C-1 through C-17

rehearsals, 2-7

assault, 5-4
covert, 6-3
deliberate, 4-5
in-stride, 3-3

scenarios,
assault, 5-3
covert, 6-3
deliberate, 4-11
in-stride, 3-6
reconnaissance, B-2

secure, 2-3
assault, 5-2
covert, 6-2
deliberate, 4-3
in-stride, 3-2

situation template, B-1, B-2
confirming, B-1
developing, B-1
refining, B-2
using in planning, B-2

Soviet obstacles, A-1 through A-8
digging capability, A-7
employment concepts, A-2
meeting engagement, 1-2
minefield parameters, A-3
minefields, A-2, A-4, A-5
minelaying capability, 1-2, A-1, A-2
POZ, 1-1, A-1, A-2
protective obstacles, 1-1, A-2
significant obstacle activities A-8
strongpoint, 1-2
tactical obstacles, 1-1, A-4, A-5

synchronization, 2-5
assault, 5-1
command and control, 2-8
control measures,
fire, 2-3, 2-4
maneuver, 2-8
covert, 6-3
deliberate, 4-4, 4-6
in-stride, 3-4
leaders' role, 2-8
rehearsals, 2-8

task organization, 2-3
assault, 5-1
covert, 6-1, 6-2
deliberate, 4-5
in-stride, 3-3

training, 7-1 through 7-12. *See* also breach training.

3000021096

PENTAGON LIBRARY
3000021096

PIN: 046482-000